COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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NEWSPAPER

Fighting Back

By Bob Johnson
CW New York Bureau

NEW YORK — Theodore Weg is fighting back.

The New York City Board of Education DPer, arrested here last year and charged with theft of computer services but recently vindicated [CW, May 3], has filed a show cause order against his employer and has indicated that he plans to sue the city of New York for false arrest, illegal imprisonment, libel, damage to reputation, impaired health and legal costs.

Weg filed a show cause order Aug. 23 against the Board of Education and Education Chancellor Frank J. Macchiarola that seeks a judgment on why he should not be reinstated as computer systems manager. Weg was suspended from that job for allegedly misusing the board's computer and was then arrested on June 24, 1981 by New York City's Department of Investigation.

The DOI charged Weg with us-

(Continued on Page 6)

Recession Underlines Woes

Unions, High Tech at Crossroads

By Marcia Blumenthal
CW Staff

While workers were marching in Labor Day parades this weekend, the serious issues of automation and high technology were being raised at the bargaining tables.

The United Auto Workers, for example, is currently in negotiations with Chrysler Corp., and one of the union's demands is that the automaker give Chrysler workers at least six months' notice before it introduces automation technology. The union giant reportedly has incorporated similar features into contracts with Ford Motor Co. and General Motors Corp.

While factory automation has been a major impetus in raising computer technology issues at the bargaining table, automation of white-collar and clerical jobs is touching off sparks in negotiating meetings more often. Today "it's not just a question of machines and systems, but whether you have a job, the skills required to do the job and the quality of life on the job," observed Harley Shaiken, research associate and a technology and labor analyst at MIT.

Wide World Photo

In the face of hard economic times, exacerbated by technology-caused job displacement, members of the International Brotherhood of Electrical Workers recently paraded through the streets of downtown Boston to demonstrate their solidarity.

Labor-displacing technology is different today from it was in the '50s and '60s, Shaiken said. Automation is much more powerful and pervasive and is being introduced against a backdrop of stagnant economic growth, he continued. Computers extend automation to every productive activity in society. With the current environment, it is not surprising that U.S. unions are increasingly turning their attention to technology issues.

In Europe, unions have long been active in technology issues, Shaiken noted. European unions have been taking a more active role in the decisions that involve deployment of new technology, a task that is usually considered the prerogative of management here.

Moreover, he pointed out, union organization of white-collar and professional workers is rapidly occurring in those countries. "In every

(Continued on Page 4)

Survey: Programmers Still 'Most Wanted'

By Bruce Hoard
CW Staff

PHILADELPHIA — Management information systems directors and vice-presidents make more money, but programmers are most in demand, according to the annual mid-summer "Data Processing Job/Salary Survey" from Fox-Morris Personnel Conaultants here.

Conducted in 100 major U.S. employment markets, the survey of computer vendor and user firms showed a steady demand for programmers, analysts, auditors, engi-

(Continued on Page 8)

"TOP TEN" DEMAND RANKING/MID-'82	JOB TITLE (AND AVERAGE MOST SOUGHT-AFTER YEARS OF EXPERIENCE)	RISE IN DEMAND FROM MID-'81
1	Systems/Software Programmers (4.2 Years)	+10.1%
2	Applications Programmers (3.6 Years)	+ 9.6%
3	Telecommunications Specialists (2.6 Years)	+ 8.9%
4	DP Auditors (3.3 Years)	+ 8.3%
5	Systems Analysts (4.3 Years)	+ 7.8%
6	Data Base Managers (9.0 Years)	+ 7.4%
7	Software Engineers (4.8 Years)	+ 7.1%
8	Systems Managers (8.5 Years)	+ 6.7%
9	Software Programming Managers (5.9 Years)	+ 6.2%
10	DP Operations Managers (8.1 Years)	+ 5.8%

Source: Fox-Morris

The Most Sought-After Professionals

Vocational Schools — Part 1

Preparing for a DP Career: Faster Route Best?

By Tim Scannell
CW Staff

Who gets the nod from the DP manager for an entry-level job? Will it be the graduate of a computer-oriented vocational school? Or the student who has snared a four- or five-year degree in the groves of academe?

In the first part of a three-part series, CW Senior Editor Tim Scannell examines some of the pros and cons facing today's entrant into tomorrow's DP environment.

The biggest decision that confronts someone breaking into the competitive data processing industry may not be which job to accept, but what kind of education to pursue before entering the job market.

That, at least, is the opinion of a number of people both inside and outside the industry who view those years of education that come after high school and before a career as critical to landing a first job.

Students fresh out of high school seeking a career in DP generally have two options: They can enroll in a vocational education school, which offers focused instruction and is the fastest route into the highly active job market, or they can sign up with a traditional four- or five-year college, which involves more time but may eventually prove to be the fastest track to a management seat.

No matter how great their efforts to provide a strong education or how impressive their placement statistics, vocational schools are often perceived as second-rate compared with a degree-oriented college education. For the most part, this stigma can be blamed on a few bad schools that put more of an emphasis on fast-buck profits than on the education of their students, according to William Goddard, executive director of the National Association of Trade and Technical Schools, based in Washington, D.C.

"Big buck seekers have never made it in this field. However, they do cause a lot of

(Continued on Page 6)

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Teleport Start Set by Year-End

NEW YORK — Construction of an Interference-free "teleport" on Staten Island is expected to begin before the end of this year, a spokesman for the Port Authority of New York/New Jersey said last week. The authority is developing the site in conjunction with Merrill Lynch, Pierce, Fenner and Smith as a "safe haven" for communications carriers and volume data communications users [CW, Jan. 18].

The first of 17 earth stations that will connect the teleport with 22 domestic satellite networks is scheduled to be in operation by the late spring or early summer of 1983. According to the spokesman, Phase 1 of the project includes connection of the teleport to the Manhattan financial district and downtown Jersey City, N.J., via fiber-optic cable.

The Manhattan extension will terminate in the World Trade Center. Since the World Trade Center is already connected to the telephone network as well as to the Manhattan Cable TV Co.'s network, users from a wide area will be able to access the teleport.

One of the first teleport users will reduce its $200 million annual communications bill by 10% to 20%.

Merrill Lynch also has an option to become a major shareholder in National Microwave Interconnect Co., one of the firms that recently won approval from the Federal Communications Commission to establish nationwide digital electronic message services.

Two major goals of the teleport project are keeping telecommunications users and carriers in New York snd providing more jobs, the Port Authority spokesman said.

Corrections

NIXDORF COMPUTER CORP.

Characteristics \ System	8890 Model 30	8890 Model 50	8890 Model 70
Relative Performance[1]	15	30	41
Mips[2]	.25	.5	.7
Memory Size in Bytes (Minimum-Maximum)	1M-2M	1M-4M	2M-5M
Purchase Price[3] (Memory Size)	$66,500 (1M)	$92,020 (1M)	$140,750 (2M)
Lease Price (Lease Term)	$2,015 (2 Years)	$2,790 (2 Years)	$4,265 (2 Years)
Machine Cycle Time (Nsec)	200	200	200
Channels[4] (Minimum-Maximum)	2	4	5
Cache (Buffer) Size	None	None	16K
Bus Architecture?	Yes	Yes	Yes
Price per 1M Byte Of Main Memory	$10,100	$10,100	$10,100

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and therefore cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. CW estimates.
3. For the processor, power supply, console and all prerequisites.
4. In addition to channels for attachment of IBM peripherals, Nixdorf 8890 processors are equipped with microprocessor-controller I/O processors to which Nixdorf peripherals can be attached. There are eight such channels available on the Model 70, six on the Model 50 and four on the Model 30, the vendor said.

In *Computerworld*'s Aug. 2 "Hardware Roundup," Nixdorf Computer Corp. was inadvertently excluded from the "IBM Mainframes and the Plug-Compatibles" category. The chart above lists specifications for Nixdorf's 8890 line of processors.

The headlines "Freight Subsystem Runs With 'Compu-Rate'" and "Transportation Control Out for System/34 Users" on Page 50 of the Aug. 30 issue of *Computerworld* were inadvertently reversed. In the same issue, some pictures in "Managers on the Move" were misidentified. From top to bottom of the rightmost column, the pictures were of Paul Byerly, Kenard Johnston, Gerald LaPorte and Russell Brundage.

Financial Graphics, Enhanced Basic and Re-Entrancy, the three new options for Sperry Univac's Financial Integrated Control System 1100 (Sufics 1100), lease for $220/mo each, not $900 [CW, Aug. 16]. A basic Sufics 1100 module can be licensed for $900/mo, the vendor said.

"System/34 Gets Collection Aid" [CW, July 26] incorrectly referred to the company introducing a software package for credit bureaus and collection agencies as Dextel Systems Corp. The correct name of the vendor is Dexel Systems Corp.

This Week

IN DEPTH
Managing the Data Center 35

NEWS
'Wingnet' — It's Definitely for the Birds 4
IEEE 802 Hits Patent Snag; IBM Solved Problem 5
Rockwell Motivating Employees to Buy Micros 7
DP Vice-President a 'Shirt-Sleeves Manager' 9
When Will Bell Resubmit BPSS Application? 10
One Dead in Shooting at IBM Plant 11
Managers on the Move 12
Access to IRS Files Eased in New Tax Bill 13
Air Freight Firm Spreads Its Wings With Net 14
Programming Helps Analyst Regain Memory 15
Sassy Program Keeps Programmers in Line 16
Neighboring Firms Make Pact to Share Systems 17
Software Development Theme of Nov. 15 Forum 20
In-House DP Goes Worldwide With Service 21
Process Control Firm Finds Handle With Minis 23
Trust Fund Manages Benefits With DBMS 24
Manufacturer Manages Growth With System 25
In-House Move Pays Benefits to Insurance Firm 26
Pension Plan Succeeds With Plug-Compatible 27
Textile Division Spins Savings With System 28
Bank Automates, Trims Teller Transaction Time 29
Firm Hikes Productivity With On-Line Reports 30
Users Help Private School 'Go Distributed' 31
Texas State Agencies Pool DP Resources 32

EDITORIAL
Editorial: Did Haste Make Waste? 44
Reader Commentary: Unauthorized CPU Users 45
Human Connection: Training Terminal Operators 45

SOFTWARE & SERVICES
Texas Department Grows Own Software 47
Ingres Relational DBMS Now Out for VAX-11/Unix 49
Altergo's Query Facility End-User-Oriented 50
Three Inslaw Packages Track Court Cases 52
'Cogen' Said to Generate Debugged Cobol 53
TI Offers Updated Version of Basic 56

COMMUNICATIONS
TI Supports X.25, Expands Networking 63
Ascii Terminals, Micros Linked to System/34, 38 64
Line-Printer Controllers Tie Teletype to DEC CPUs 66

SYSTEMS & PERIPHERALS
Avoid the Pitfalls of Disk Maintenance 69
Xerox Expands Line of Scientific Processors 70
Drafting Tool Fits Cadmax 72

MINIWORLD
Productivity Up for First Users of System/38-7 73
Plug-In Board Helps Provide Virtual System 74

OFFICE AUTOMATION
Execs See DPers Running, Not Dominating OA Future 77

COMPUTER INDUSTRY
CDC Concludes Earnings Gain Unrealistic 81
STSC Acquired at Opportune Time 81
Sorbus Cuts Service Pacts 85
Hard Disk Mart Seen Reaching $17.8 Billion 88

ADVERTISING INDEX 118

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'Wingnet' — It's Definitely for the Birds

By Tim Scannell
CW Staff

SUNNYVALE, Calif. — Some companies use local-area networks and leased lines. Others swear by microwave dishes and satellites.

But here in the center of high technology and computer innovation, the Lockheed Missile and Space Co. has found an older, faster and less expensive way of getting information from here to there — by Columbidae, more commonly known as pigeons.

Lockheed uses its feathered fleet — which numbers about 15 — to shuttle microfilmed data from its headquarters here to its isolated research and design facility located about 30 miles away on a mountaintop just outside Santa Cruz. The firm can transmit the data over telephone lines from Sunnyvale's IBM computers to a Versatec, Inc. electrostatic printer at its other facility, but using the pigeons instead costs about 10 times less than using the machines, explained Will Hilbrink, a spokesman for the firm.

The data in question is actually a product of the mountaintop research site, but is transmitted to and printed in Sunnyvale. Lockheed's headquarters sends the microfilmed material back via carrier pigeon so that the firm's engineers there can review what they have produced, Hilbrink said.

Like all carriers of the winged persuasion, the pigeons are trained to fly just one way — from Point A to home. So before the pigeon-toed network can become operative, a bird must be transported along winding roads down the mountainside from the isolated site to the Sunnyvale headquarters. This is done on a daily basis as part of the regular mail run.

When shipment time arrives, a capsule containing the microfilm is attached to the pigeon's leg, and the bird is released to begin its journey home. "We fly about one bird a day," Hilbrink said. "This gives them a lot of rest."

Lockheed launched "Wingnet" after one of the firm's scientists saw a television show depicting a hospital that used pigeons to transport blood samples to a nearby testing laboratory. Since shipping the needed Lockheed data manually involved driving over 50 miles of rugged mountain roads — a full day's work — the firm decided to adopt the hospital's transportation means-of-another-feather, so to speak.

Lockheed has been contacted by other firms that have expressed interest in augmenting their computer-based information retrieval systems with pigeons.

Lockheed, which has been using pigeon power to transmit data on a full-time basis since the beginning of this year, bought its first birds from a local pigeon racing club. The firm recently began breeding its own carrier pigeons.

A Few Glitches

However, even the best systems have a few glitches.

During its trial run, Lockheed's feathered fleet logged two casualties: one bird flew into a high-powered electrical wire and the other just kept on flying. Fortunately, only test data was lost.

Also, unlike the U.S. Postal Service, Lockheed's pigeons think rain, sleet and gloom of night are not for the birds.

"If it's too stormy, they won't fly," Hillbrink said. "They'll just roost and sit out the storm."

When this happens, the computer understudies are used to transport data instead of the grounded birds.

Unions Wrangling With Automation Issues

(Continued from Page 1)

major European country, the issues raised by computerization of the work place have been the subject of political debate."

Shaiken thinks that awareness is on the rise in the U.S. union movement. Recently, the International Association of Machinist and Aerospace Workers established a "Technology Bill of Rights," according to Shaiken (see story at right).

UAW Contract

The UAW Local District 65 in Boston has negotiated contract language for CRT terminals and technology change in recent contracts, according to Carol Knox, an organizer for the clerical and technical workers at Boston University. Last year, the contract for the 850-member bargaining unit called for maintenance logs for CRTs, disclosure of the manufacturer's safety and health specifications for CRT terminals and eye examinations for workers.

Moreover, Boston University must notify workers two months prior to instituting technology that would displace jobs and must provide on-the-job training for displaced workers. About 110 workers in the bargaining unit have been trained on terminals so far, Knox reported.

Currently the local UAW chapter is looking into a provision that would permit workers to refuse to work on CRT terminals during pregnancy. Knox said there have been three miscarriages and one troubled pregnancy among women working with terminals, which is a higher than normal incidence of these events.

In general, unions are trying to obtain more employee participation in the employer's decision to automate, said Pat Thomas, education director at the Service Employees International Union.

'Technology Bill of Rights'

CAMBRIDGE, Mass. — Although the U.S. labor movement is not yet as aggressive in negotiating for technological change as are its European counterparts, the "Technology Bill of Rights" recently established by the International Association of Machinist and Aerospace Workers is a move in that direction.

That union statement seeks to link the introduction of automation technology to specific gains for workers, explained Harley Shaiken, a research associate and technology and labor analyst at MIT here.

The document focuses on three areas of concern. One is that as a precondition for the introduction of automation, employees work less time for the same pay. The rationale is that productivity creates increased profitability, which in part can be applied to working conditions. The union's approach is unique because it seeks this provision before technological change, Shaiken explained.

The second area addressed by the technology bill of rights stipulates that automation must enhance the quality of the job. This means skill cannot be removed from a job through automation and workers cannot be controlled by a machine monitoring their work.

The bill states that new technology should be used in a way that expands the economic base of the country and enhances the environment.

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IEEE 802 Hits Patent Snag; IBM Solved Same Problem By Shelling Out $5 Million

By Bruce Hoard
CW Staff

The IEEE 802 Committee on Local Area Network Standards has hit a legal snag that could prolong its 2½-year effort to create standards.

Faced with the same problem, IBM solved it by paying out more than $5 million.

The problem arose when the Dutch-owned Willemijn Holding Co. stepped forward as the patent holder of a local-area network token passing scheme similar to the one on which the 802 committee is working. Willemijn and its Vice-Chairman Olof Soderblom, who developed and patented the scheme, are asking for substantial sums of money to license it.

In this case, "substantial" amounts to $25,000 (down from an original demand of $100,000) for an initial license plus $45 for each node attached to applicable token passing local-area networks.

IBM Buys Rights

IBM decided in 1980 that it would license the controversial patent for its 8100 local loop, which is a local network based on a master and subordinate nodes. IBM paid Willemijn "over $5 million," according to Soderblom's attorney, George Vande Sande of the Washington, D.C., law firm of Pollock, Vande Sande and Priddy.

By possessing rights to the patent, IBM could be in compliance with the 802 standard once it is ratified. If the 802 standard is dissimilar to the patent or does not win approval, IBM could still have what might become a de facto standard anyway.

The token passing scheme that IBM's representatives presented to the 802 committee last March is not based on the Willemijn patent, an IBM spokeswoman said.

IEEE: No Infringement

Dr. John Rigonatti serves as the IEEE Computer Society representative to the IEEE's standards committee. According to Rigonatti, there is a "significant concensus" among 802 members that their uncompleted token passing standard will not infringe on the Willemijn patent.

"It really isn't an issue yet," Rigonatti said in an interview last week. Nor does he expect it to become one. Rigonatti sees a basic distinction between the master-subordinate nature of the Willemijn scheme and the proposed 802 standard, which assigns equal line access power to each network node.

Nonetheless, Rigonatti wants the IEEE standards committee to come out with a policy statement on how the patent problem may be resolved in a formal way and who will be responsible for solving it. At this point, the IEEE has not investigated all the legal ramifications involved, he said.

Soderblom's lawyer, Vande Sande, said his client first patented the token passing scheme in Sweden in 1967, assigning the rights to a bank at which he worked. The worldwide rights were subsequently assigned to Soderblom and "within the past couple of years" passed on to Willemijn.

The U.S patent was issued Oct. 6, 1981 and is good for 17 years.

Vande Sande said he first proposed the $25,000, $45/node plan to 802 Chairman Maris Graube in a June letter. The two met at an 802 meeting held this August in Boulder, Colo. At that time, Vande Sande said, he and Soderblom did not receive a formal reply to the proposal. What they did receive was a "not unexpectedly hostile position" from some committee members, he claimed.

Graube was not available for comment.

Noting that Willemijn's raison d'etre is the selling of patent rights, the attorney stated, "Why that should suddenly be considered by some people to be a sort of nefarious activity and smack of banditry is more than I can understand."

Patent Not Enforceable?

WASHINGTON, D.C. — Willemijn Holding Co.'s patent for a local-area network token passing scheme similar to the one on which the IEEE 802 Committee on Local Area Network Standards is working may be invalid, Daniel T. Brooks of Computer Law Advisers here said last week.

While the U.S. Patent Office checks to see if prior patents were issued on the same claim, it does not "substantively examine the novelty, nonobviousness and other requisites in more than a preliminary sort of way," Brooks explained. "It has always been left to litigation between the parties directly affected to determine the enforceability of the patent."

That ultimate strength of the patent is defined by its claims, Brooks said. If some of those claims are invalid because there are preexisting patents in the area, or if the invention is already in the public domain, the patent itself may be declared invalid.

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COMPUTER ASSOCIATES

Vocational School vs. College: Which Path Best?

(Continued from Page 1)

fuss when they come in," Goddard observed.

Presently, there are about 1,100 vocational schools in the U.S. that offer some sort of DP training, ranging from basic introductory courses to advanced programs in systems programming and design. Slightly more than 200 schools that are registered with Natts concentrate solely on DP training. About 50 of these focused schools are accredited by the association; the others are accredited by the Association of Independent Colleges and Schools (AICS), which focuses on professional business schools, or have no type of accreditation at all, according to Goddard.

Ten to 15 years ago, Natts' biggest problem was the number of complaints filed by students who had been ripped off by some fly-by-night vocational school and by would-be DPers who went to class one day to find that the school had suddenly become a vacant storefront. At that time, there were about 700 DP-only vocational schools across the country, and the DP education field was filled with people trying to cash in on the teaching boom.

Critical Report

As recently as four years ago, the New York State Consumer Protection Board released a highly critical and much criticized report on the proprietary vocational school industry in New York State. The report accused schools of luring students with false promises of placement and jobs that reportedly never came about [CW, Sept. 18, 1978]. It also charged that many schools overlooked academic credentials and entrance test results in order to attract students eligible to receive government aid.

The Consumer Protection Board is currently reviewing that report and preparing an update for release sometime next year, according to a spokesman for the state agency.

Today, vocational educational — at least on the DP scene — is not the same animal it was five or 10 years ago. In fact, it is now rare for Natts to receive a complaint from a student who feels slighted by a private school, Goddard said, noting that 48 of the 50 U.S. states have strong licensing laws that govern the operation of vocational enterprises.

So the only worry a vocational student now has seems to be whether that particular educational path is the best road to a successful career.

Faster Entry

Without a doubt, vocational students do enter the DP work force more quickly than those traveling through the groves of academe. Most graduates find entry-level jobs in the industry within 30 days of graduation, according to Goddard.

"Companies are eager to acquire these people because a lot of [the companies] want warm bodies ... someone who is basic enough to be at least familiar with the jargon," he explained.

However, vocational school graduates may not have as good a shot at upper-level and management positions as a college graduate with a degree in computer science. The vocational student may even risk being passed by when promotions are handed out within a corporation.

"It's cheaper for a company to get a body out of a vocational school. But what they want that body to be able to do is unrealistic," claimed Paul Kalaghan, dean of Northeastern University's recently launched College of Computer Science.

Kalaghan, who has worked in the computer industry and is an astronomer and a physicist, insists that when a job seeker knocks on personnel department doors, a four- or five-year college degree can make more noise and attract more attention than a certificate from a vocational school.

Kalaghan pointed out that the old days of the "wizard programmer" are gone. Most DP shops are very formalized and want to hire someone who has had more than a slight taste of what DP involves.

"You'd like someone to be able to be literate and to be able to interact with other people, and some of the discipline of a longer educational path shows there," the Northeastern computer science dean said.

Some vocational schools are adapting to meet the demand for both a college degree and intensive training in DP. For example, the Cambridge Institute for Computer Programming in Boston offers a 650-hour course covering languages such as Cobol, assembly and Fortran, as well as instruction in data base management, systems analysis and programming logic. Grumman Data Institute of Long Island, N.Y., boasts a similar program.

And there is always the option of pursuing a college degree after completing a vocational program and landing a job.

Weg Takes on Employer, New York City

(Continued from Page 1)

ing Board of Education computers to trace racehorse genealogies as well as to manage other personal business. However, in April of this year, the theft of services charges were dismissed by Brooklyn Criminal Court Judge Michael R. Juviler [CW, May 3].

Juviler granted Weg's request for dismissal of the case maintaining that because the DPer had legitimate access to the computer and he did not receive any commercial gain by using it, he did not commit any crimes as far as New York State laws are concerned.

The Board of Education had no comment on the show cause order.

In an exclusive *Computerworld* interview last week, Weg said that although he has been legally vindicated, media exposure has hurt him professionally a great deal. Although he has gone on a number of job interviews and has dealt with many headhunters, he has had no success finding a new job.

Weg is still officially employed by the Board of Education. Because of his failure to find another job, Weg said, he has no choice but to go back to work there, even though he realizes that his position will be uncomfortable.

Setting Record Straight

Stating that he wants to "set the record straight" about what really happened during what he referred to as "slipshod" investigation by the DOI, Weg pointed to a number of circumstances in the case that he feels are questionable. He said that it is very possible that he was "set up" by the DOI.

"I was arrested the same day the mayor's directive describing restrictions on municipal computer use and computer security standards was issued," he noted.

Moreover, he said, sources within the Board of Education told him that the day after he was arrested everyone involved in data processing at the Board of Education was told to get all their personal data off the systems.

Weg maintained that the DOI did not investigate the case properly until after he was arrested. "The DOI thought they had a patsy. Someone at the board passed information to them about me abusing the system. In fact, there was never any security breach, and more importantly, the board had no published restrictions as to what could or could not be done," he said.

Weg admitted he used the computer to do things such as compile a resume, create mailing labels for a nonprofit community group to which he belongs and maintain racehorse files. He stressed, however, that nothing was done for commercial gain and that he had done nothing that is uncommon in any DP shop.

"If someone is using the system to change or alter data, that is wrong. I'd be the first guy to stop it," Weg said. "In fact, I was in a position myself to warn one of my workers not to use the system in such a manner."

Concerning the stored racehorse genealogies, which became a focal point in his case, the DPer explained that he put them up on the system because he owns a small interest in two horses and he enjoys the sport. "At the time, I was installing a CICS inventory system and I didn't know too much about Vsam files. What I did was store the racehorse data as a fun way of practicing," he said.

The information was stored only in a filing capacity and could not be used in any sort of analysis for commercial racehorse handicapping or breeding, he claimed, adding that his superior was aware of the file and called it "cute."

When Weg was arrested, reports told of Weg being a part owner in a horse farm called Castellani's Stables. Weg flatly denied being involved in any such business and said that to his knowledge, no farm of that name even exists.

"The DOI's inaccurate investigation probably revealed a fictitious label file I created on my library called Castellani's Stables. I did it as joke for a friend of mine who is also interested in horses," he said.

Weg pointed to another "questionable" aspect of the case. He said that a sworn affidavit produced by the DOI as evidence was in fact "forged."

According to Weg, because the assistant district attorney prosecuting the case had a problem making any criminal charges stick against him, he tried to have Weg's superior sign a document swearing that Weg used the computer for commercial gain. When Weg's boss would not sign it, the assistant district attorney presented a document that said Weg used the computer for "substantial" benefit to himself, Weg said. The DPer maintained that the word "substantial" was subsequently crossed out and replaced by "commercial."

What is most frightening about the whole situation, Weg explained, is that the computer industry's paranoia about security may start a rash of "witch-hunts." He said management for the most part is unaware of where the line should be drawn about what computer abuse really is. "I fear a type of McCarthyism will emerge as a result of all of this," he said.

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Offers Financial Incentives

Rockwell Motivating Employees to Buy Micros

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — A division of a leading U.S. electronics and aerospace firm is offering part of its work force various financial incentives in an effort to encourage the employees to acquire and learn how to operate their own personal microcomputers.

Rockwell International Corp.'s Energy Systems Group (ESG) recently negotiated special purchase agreements with several manufacturers of popular business-oriented personal computers. Some of the suppliers include IBM, Commodore Business Machines, Inc., Radio Shack and Hewlett-Packard Co.

The agreements, each of which was forged separately, allow qualified employees to buy their own personal microcomputers at the same corporate discounts that ESG would be entitled to if it were purchasing the equipment in volume. The size of the discounts varies widely from vendor to vendor, according to the division's data base administrator, Bill Ambrose.

Employer Picks Up Tab

Another provision of the agreements is that they call for no initial down payments and spare ESG's microcomputer buyers from having to pay any monthly finance charges, Ambrose said. The tab for all finance charges is picked up by the users' employer.

Under the arrangement, the buyers' only financial responsibility is to pay a series of monthly installments, which are automatically deducted from the employees' paychecks and applied toward their unpaid balances. The exact amount of the payroll deductions, which can range as high as $100/mo, is left to the workers' individual discretion, Ambrose said.

Since its inception last spring, the financial incentives plan has prompted an estimated 100 of ESG's 2,000 employees to acquire their own business-oriented microcomputers. Similar agreements have also been adopted by two other Rockwell business entities — the Space Operations and Aircraft Operations Divisions, according to a company press spokesman.

Within ESG, the only employees currently eligible to take advantage of Rockwell's financial incentives are certain classes of staff engineers, who are using their newly acquired micros almost exclusively in their homes. "There might be some legal complications if people tried to have the machines installed in their offices," Ambrose said.

Although most of the engineers' home microcomputers are operating strictly as stand-alones, a few of the machines have been equipped with a dial-up communications feature that allows them to gain remote access to some of Rockwell's host mainframes.

The on-line communications capability, which is not now covered by Rockwell's financial plan, allows employees to "receive trouble calls [from the office] and use their home computers as terminals to log into the corporate computing center," Ambrose said. "In this way, people can analyze and solve business problems at home rather than have to drive long distances to come into their offices."

The purpose of Rockwell's financial incentives plan is to encourage engineers who have little or no first-hand DP experience to improve their computing literacy. "Rockwell has an ongoing commitment to skills development among its employees," Ambrose said. "Microcomputers are tools that are going to be used more and more widely in the business community, and it's to the corporation's advantage that our people learn how these tools should be used."

For financial reasons, ESG is providing its microcomputer buyers with practically no formal computing or programming instruction, even though many of the employees are comparative newcomers to DP. Most of the division's new microcomputer owners, therefore, will either have to learn how to operate the machines on their own or have to acquire the necessary technical skills with the help of an in-house Rockwell users group.

Conference Papers On AI Published

LOS ALTOS, Calif. — A compendium of papers presented at the National Conference on Artificial Intelligence, held Aug. 18-20 in Pittsburgh, Pa., has just been published by William Kaufmann, Inc.

Proceedings of the National Conference on Artificial Intelligence consists of 104 papers by 183 authors. Topics include vision, natural language and speech, problem solving and search, knowledge representation and theorum proving. The text includes illustrations as well as bibliographic references for each paper.

The 456-page volume costs $25 from Kaufmann, 95 First St., Los Altos, Calif. 94022.

Survey Finds Programmers Hottest Item in Job Market

(Continued from Page 1)

neers, managers and other software experts. It reported that there are 550,000 systems/software and application programmers in the U.S.

In addition to MIS directors and vice-presidents, who were earning 13.5% more at midsummer than last year, data base managers, systems managers and software engineers all were earning more this summer than programmers. However, the MIS director or vice-president averaging $52,080 had 14.4 years of experience, compared with 4.2 years for the systems/software programmers earning an average of $31,500. That figure is 16.3% more than last year.

Data base managers, systems managers and software engineers were making $42,460, $37,100 and $31,667 based on nine, 6.5 and 4.8 years of experience, respectively. Software engineers registered the biggest salary increases over the past year at 14.1%. Data base managers went up 10.1% and systems managers, 8.7%.

Increased Demand

In the increased demand category, demand for systems/software programmers shot up 10.1% from last year, while MIS director/vice-presidents did not even finish in the top 10. The category bottomed out at a 5.8% increase for DP operations managers. Applications programmers finished second at 9.6%.

The No. 3 through No. 9 slots were filled by telecommunications specialists (2.6 years experience, 8.9% demand increase); DP auditors (3.3 years, 8.3%); systems analysts (4.3 years, 7.8%); data base managers (nine years, 7.4%); software engineers (4.8 years, 7.1%); systems managers (6.5 years, 6.7%); and software programming managers (5.9 years, 6.2%).

Overall, the study indicated, this year's demand for DP pros averages 7% more than last year.

Geographical Distribution

Geographically, salaries were highest on the West Coast, in New York, Boston, Houston, Chicago, Philadelphia, Denver and Atlanta.

Within major industry groups, salaries were highest among computer-related vendor companies, followed by transportation, retailing (particularly top management), manufacturing, the federal government, banking and education.

Fox-Morris attributed the demand-over-supply imbalance to the dearth of computer science undergraduates. For example, the nation's campuses produced an estimated 10,000 or fewer such graduates in 1982, a number the survey called "substantially below present needs."

One hiring problem cited by many respondents "stems not so much from the shortage of qualified personnel as from the tendency of good people to stick tight to current employers rather than risk a move in today's uneasy '82 employment climate," the survey said.

Another problem faced by many companies in attracting top talent is their lack of internal career path development programs for DPers, Fox-Morris found. "Too many companies, good candidates feel, are simply looking for 'worker bees' — people who will do all the hands-on work without regard for their own growth," the survey reported.

Yet another major stumbling block to hiring is the "still rampaging" home mortgage rate situation, which the survey says makes candidates unwilling and/or unable to sell their present homes for relocation purposes.

The talent shortage has opened the employment doors to women, who have been "somewhat" underrepresented in the DP field, the survey says. However, it adds, the number of women with a strong technical background is still relatively low.

What does Fox-Morris have to say about the future? "Demand will continue to escalate for both skilled and entry-level specialists and the talent supply will continue to be scarce at all levels."

The survey report is available free of charge from the Data Group at Fox-Morris Personnel Consultants, 1500 Chestnut St., Philadelphia, Pa. 19102.

VARIOUS TYPICAL RANGE OF JOB TITLES	AVERAGE YEARS OF EXPERIENCE	AVERAGE U.S. SALARIES (& AVERAGE HIGHS)	% SALARY CHANGE FROM MID-'81
MIS Director/VPs	14.4 Years	$52,080 ($60,000)	+13.5%
Data Base Managers	9.0 Years	$42,460 ($49,500)	+10.1%
Systems Managers	6.5 Years	$37,100 ($43,000)	+ 8.7%
Software Engineers	4.8 Years	$31,667 ($39,500)	+14.1%
Systems/Software Programmers	4.2 Years	$31,500 ($39,500)	+16.3%
Systems Analysts	4.3 Years	$31,375 ($40,800)	+15.7%
DP Auditors	3.3 Years	$29,400 ($38,500)	+ 5.4%
Telecommunications Specialists	2.6 Years	$29,375 ($36,700)	+ 7.1%
Applications Programmers	3.8 Years	$27,562 ($36,000)	+13.6%
Entry B.S. Computer Sciences	None	$20,415 ($25,500)	+15.3%

Source: Fox-Morris

1982 Salaries

Stace Receives DPMA Award

James W. Stace

BARK RIDGE, Ill. — James W. Stace of Somerville, Mass., has been awarded the Data Processing Management Association's DPMA Individual Performance Award.

In 1975, Stace received the United Cerebral Palsy Humanitarian Award for his design and implementation of the CP Telethon Computer Pledge System for the New England states. In 1981, he was certified by the DPMA to present management seminars on Project Map.

Stace has been in management and DP for 30 years and has held positions in operations, systems and programming and consulting.

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Spends Majority of Time Programming

DP Vice-President a 'Shirt-Sleeves Manager'

By Jim Bartimo
CW Staff

JACKSON, Mich. — "I'm very much a shirt-sleeves manager," Mark Alyea said of his position as data processing vice-president at the Alro Steel Corp. "I spend 60% of my time programming."

" I'm more effective as a manager knowing what can and can't be done on the system," he maintained.

When Alyea is not programming, he is a high-level manager who has the ear of the company president and the attention of the board of directors — all of whom are concerned these days with boosting revenue growth. "DP is viewed as a way to provide better support for sales and inventory," Alyea said.

Alyea's double identity is possible because of the small size of Alro Steel. The steel distributor has a total of six warehouses in Michigan and Florida, employing 200 people. Serving tool and die companies, Alro also has a variety of other customers including automakers in Detroit, Alyea said.

Growing Firm

Despite its relatively small size the firm is growing, and its approach to DP reflects that growth. Alro's year-old IBM System/38 replaced a System/34 shortly after Alyea joined the company. "One of the reasons was for the software capability and flexibility and the capacity," Alyea said.

"We have three people in DP," he said. "[The System/38] is extremely complicated for a small staff, but once we learned about it, it worked out better than we expected." Among the applications currently on the system are inventory, purchasing, sales analysis, billing and inventory, accounts payable and receivable, fixed assets and word processing. As the company grows, there is still room on the system for other applications such as general ledger, Alyea said.

"We are using the data base quite extensively," he said. "The architecture of the System/38 really forces you to." The mainframe is running the IBM Control Program Facility, which allows Alro's two programmers to write software in the RPG III language.

A total of 21 terminals, including those on the vice-presidents' desks, can access the system. The Florida warehouses use leased lines; local warehouses use dial-up lines to communicate with the DP center, Alyea said.

"Our philosophy is to use the system to its maximum," he said. The system services the sales and inventory aspects of steel distribution with terminals in each of the six warehouses. "The two most important things about distribution are where it's going and where it is," he said.

One growth area for Alro is its sideline of industrial tools. Alyea would like to use the system to put these customers and steel buyers on-line. "We want to put low-cost terminals into our customers' offices and, using dial-up lines, " allow them to order directly through the system, Alyea said. "We would first create a customer profile on the system and when the customer keys in an order, the system would either confirm it or put it on back order."

Another possible growth area concerns the software that Alyea has helped create. With one sale to an East Coast steel distributor, Alro may market its software packages to other companies, he said.

"Our emphasis is on return on investment," Alyea pointed out. "We look for 90% of the service for 30% of the cost, rather than pay 100% of the service for 100% of the cost. We see DP as a tool to accomplish our goal. It's that strategy that makes us superior."

Alyea started his DP career in motorcyle retailing after one year of college. He had no computer experience when the store purchased an early IBM System/3 to keep track of its inventory, but learned enough about the system to go on to other DP positions. The 30-year old Alyea has an associates degree from Oakland Community College and is working on his bachelor's degree. After a year at Alro as DP director, he was recently promoted to his current position of vice-president.

Bibliography Covers Computer Security

WHEATON, Md. — GPD Press has published a reference book entitled *A Bibliography of Computer Security Bibliographies.* The book contains the contents of 70 different computer security bibliographies issued between 1967 and 1981.

Subjects covered by the bibliographies include computer crime and abuse, access controls, encryption, contingency and disaster recovery planning, DP risk analysis, privacy safeguards and transborder data flow and telecommunications security.

The book costs $19.95 plus $1.50 for postage and handling from GPD Press, 11949 Bluehill Road, Wheaton, Md. 20902.

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When Will Bell Resubmit BPSS Application?

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — How soon before AT&T resubmits its application for the Bell Packet Switching Service (BPSS) to the Federal Communications Commission (FCC) was a popular question here last week.

The phone company's first submission was rejected by the commission in late July on procedural grounds. The FCC ruled that AT&T, instead of submitting a tariff, should have filed a "Section 214 application" requesting authority to install BPSS facilities.

The distinction was much more than a lawyer's argument. As FCC Commissioner Joseph Fogarty pointed out when he commented on the July decision, the BPSS application represents the first implementation of the FCC's Second Computer Inquiry Decision, so the commission's actions are likely to set precedents.

Key Question

For data communications users, the key question is whether BPSS will be a shared or dedicated service.

As proposed, BPSS is a dedicated service. Each user would have to lease an entire BPSS switch at a minimum cost of $77,000 per month plus hefty "service establishment" fees. Furthermore, each user would have to provide its own packetizing/depacketizing capability since BPSS supports only the transport functions — such as error control, sequencing and routing — associated with packet-switched networks.

There are strong indications, however, that AT&T will decide to allow sharing of BPSS facilities. For one thing, the FCC has indicated it will insist on this change as the price for authorizing BPSS. The commissioners said last July that when AT&T resubmits BPSS, the company should "buttress its claims that BPSS will have general utility and is not an offering primarily tailored for its separate subsidiary."

Prospective competitors of BPSS, in their earlier comments on BPSS, had argued that by offering the service only on a dedicated basis and charging allegedly exorbitant fees, AT&T was intentionally restricting the service to a single client — American Bell, Inc., its newly formed subsidiary.

If AT&T can win the FCC's blessing by allowing BPSS switches to be shared — and according to an FCC staff member, there is "a 95% chance the service would be approved on that basis" — it would be a cheap price to pay because the phone company's competitors have raised a number of other issues.

One involves whether BPSS is a basic service. GTE Telenet Corp. and Tymnet, Inc., among others, contend that to meet the strictures of the Second Computer Inquiry, the bits input to BPSS must have the same speed, format and packet size when they are output.

The X.25 protocol, which will be employed by BPSS, offers a range of network-resident protocol conversion features that are the essence of an "enhanced" rather than a "basic" service, according to the critics. Thus, they contend, BPSS cannot be offered by AT&T Long Lines since it is a regulated entity and the Computer II decision bars such entities from offering enhanced services.

Analysis

The FCC appeared to reject this argument in its July ruling by pointing out that "there is no question Computer II permits AT&T to offer a packet-switching service such as BPSS in the network as a basic service."

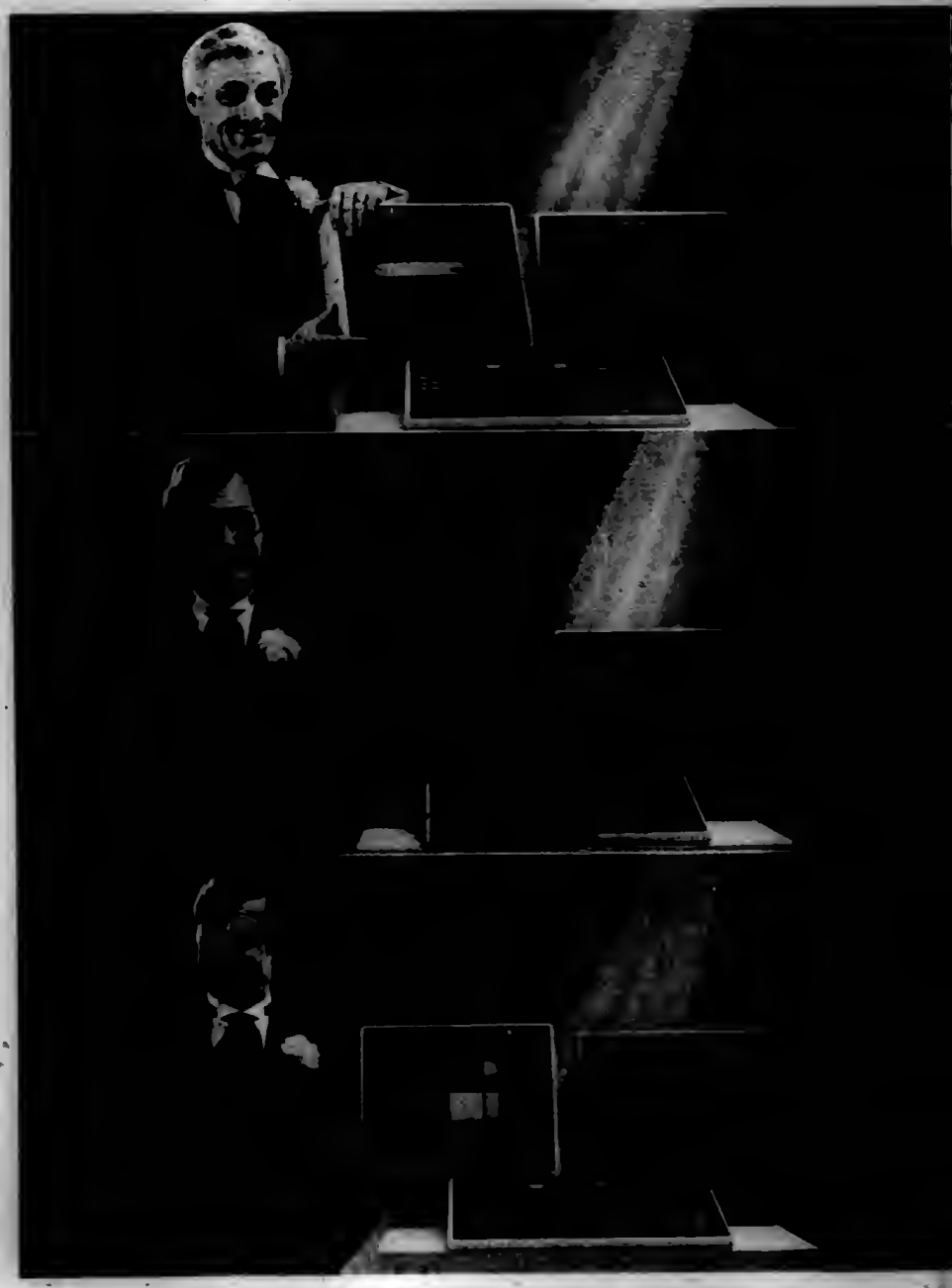
Another issue is whether BPSS customers will have to employ a Channel Service Unit (CSU) obtainable only from AT&T. Independent modem manufacturers, individually and collectively, have been up in arms about this requirement ever since it was incorporated into AT&T's Dataphone Digital Service tariff in 1974. They insist that independent manufacturers can produce CSUs that meet all the relevant technical specifications and can offer them to the user at a price lower than AT&T's asking price.

The phone company's position is that the CSU is part of the network — specifically, the Data Circuit Terminating Equipment — and thus must be supplied by the network operator.

The staff of the FCC's Common Carrier Bureau last May asked AT&T a number of questions about the CSU in the course of developing a recommended decision on BPSS which was submitted to the commissioners shortly before last July's meeting.

The FCC's July order asked the phone company to "focus upon and clear up several of the concerns raised in the pleadings"; in other words, the comments submitted earlier by competitors and other interested parties. Several pages were devoted to an enumeration of these "concerns," but the CSU restriction was not among those listed.

If the FCC decides not to lift the CSU restriction and/or concludes that the packet-switching scheme proposed by AT&T does not violate Computer II, competitors may take the commission to court.



Wide World Photo

Leonard Avery is taken into custody after high-speed chase.

Former Employee Charged.

One Dead in Shooting at IBM Plant

By Susan Blakeney
CW Staff

RESEARCH TRIANGLE PARK, N.C. — A former IBM employee will be charged with murder and assault for shooting and killing one man and seriously injuring another at the IBM manufacturing facility here last week. It was the second shooting incident in three months involving a former IBM employee (see box).

Leonard D. Avery, 39, of Raleigh walked into Manufacturing Building 201 at the IBM facility last Monday afternoon and opened fire. Ralph A. Glenn, an inventory control specialist who had worked for IBM since Dec. 31, 1973, died in the ambush, and Richard D. Martin, a telecommunications manufacturing plans and control manager employed by IBM since April 6, 1953, was "seriously injured," according to Capt. Tommy King of the Durham County Sheriff's Department.

Three other employees who received minor injuries were treated and released.

Avery was armed with four Molotov cocktails, a .45 caliber semiautomatic rifle, a 16-shot .22 caliber rifle, numerous rounds of ammunition and the .22 caliber single-shot derringer pistol that he eventually used on himself, according to King.

Avery had worked as a senior keyboard assembler in a nearby building at Research Triangle Park from November 1970 until Aug. 19 this year, when he was terminated, IBM spokesman Michael Pandich said. IBM would not disclose the reason for the termination, deeming it "privileged information," nor would it discuss whether Avery had voiced any grievances or received counseling while employed by IBM.

Two Durham deputies who were patrolling Research Triangle Park heard the commotion and intercede. After Avery fired at them, he fled the IBM building under pursuit. A high-speed chase down Interstate 40 ended some 12 to 14 miles later in the Wade Avenue area of Raleigh.

Avery then shot himself in the frontal section of his brain and was taken to the Durham County General Hospital, King said.

At press time last week, Avery was being held at the hospital under 24-hour surveillance until he is well enough to be moved for indictment. He will be charged with murder, five counts of assault with intent to kill and two counts of assault with a firearm upon law enforcement officers.

May Shooting Killed Two.

The shooting spree at the IBM manufacturing facility in Research Triangle Park, N.C., last week was the second such incident involving an IBM employee in three months.

On May 28, Edward Thomas Mann left two people dead and eight wounded after staging a seven-hour standoff in IBM's Federal Systems Division building in Bethesda, Md. [CW, June 7]. A Dec. 6 trial date has been set in the Mann case, according to Michelle Kingsley of the Montgomery County State's Attorney's Office.

When asked if the police department saw any correlation between the two incidents, Captain Tommy King of the Durham County, N.C., Sheriff's Department said: "It's like the airplane hijackings — once they started, it became almost a daily thing. Sometimes with this kind of thing, one does trigger another."

HP 3000 Users Group To Meet Oct. 24-29

COPENHAGEN — Hewlett-Packard Co.'s HP 3000 International Users Group (IUG) will hold its 1982 European conference here Oct. 24-29.

Technical papers at the conference will address contingency planning, risk analysis, networking, access control and other topics germane to the theme, "System Security in the '80s."

The registration fee, including five nights' accommodations, is $860. Additional information can be obtained from the Conference Manager, HP 3000 IUG, 289 S. San Antonio Road, Los Altos, Calif. 94022.

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Burroughs

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Managers on the Move

Steven Iwanicki

STEVEN IWANICKI has been designated manager of West Penn AAA's Motor Club Data Processing Department in Pittsburgh, Pa.

He began his employment with West Penn Motor Club as a systems programmer. Before joining the company, he served as data processing manager of Hollytex Carpet Mills and as a computer operator for Pittsburgh National Bank.

Iwanicki is a graduate from the Institute of Computer Management in Pittsburgh and is vice-president of data processing for the newly founded Tri-State Area Wang Users' Group.

•••

AL GUTIERREZ has been appointed to the newly created position of data processing manager for Circle Metals, a distributor and processor of aluminum and stainless steel, based in Carson, Calif. He will manage Circle's new IBM System/3 Data Processing Computer Center, which will be operational this fall.

Prior to joining Circle Metals, Gutierrez was a programmer/analyst with Southwest Leasing Corp.

He received a B.A. degree from California State University.

•••

ROBERT F. FLOOD JR. has been named director of telecommunications for Mervyn's stores, a chain of retail stores with corporate headquarters in Hayward, Calif.

Before joining Mervyn's, Flood was with Xerox Corp., where he was most recently manager of West Coast consulting and operations in the Data Processing and Telecommunications Services Department. Before that, Flood served in a number of positions with Rochester Telephone Corp., including marketing analyst and product planning manager.

Al Gutierrez

Flood received an A.S. degree in engineering from Monroe Community College in Rochester, N.Y., and a B.S. degree in electrical engineering from the University of Rochester. He is currently an MBA candidate at Golden Gate University in San Francisco.

•••

AJIT BADMI has been selected manager of the Computer Services Division of Engineering Information, inc., located in New York City. He will be responsible for all computer activities including hardware, software and data communications.

Previously, Badmi served as a consultant for Stone & Webster Engineering Corp. and Compuchen, a consulting firm that he founded in India.

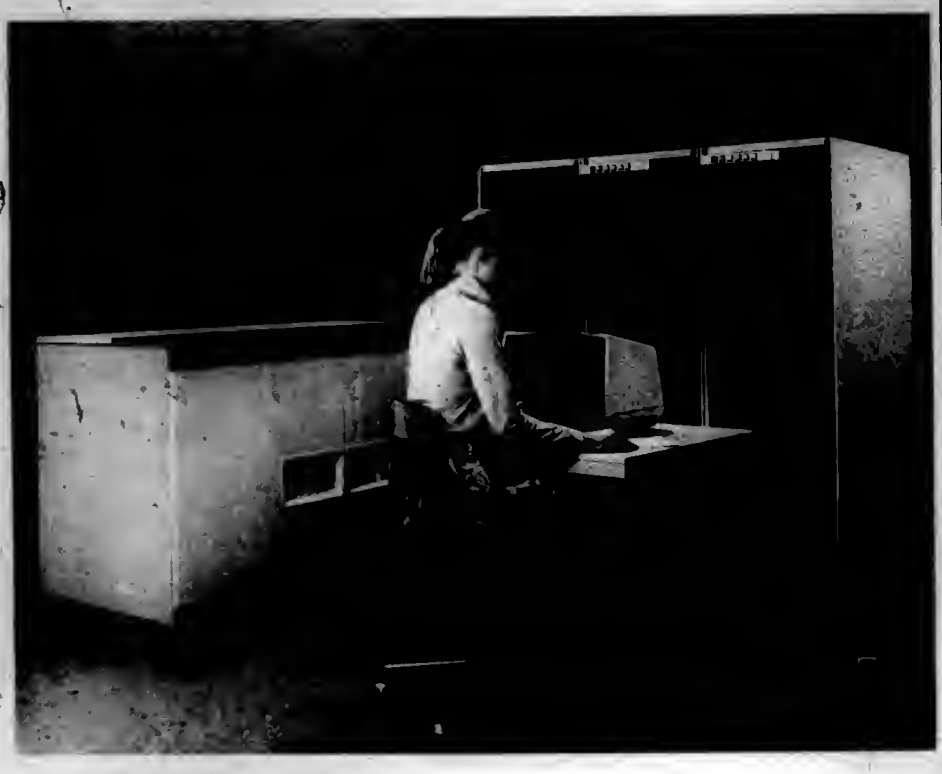
He earned a B.S. degree in chemical engineering from the Indian Institute of Technology, an M.S. degree in chemical engineering from Carnegie Institute of Technology and an M.S. degree in computer science from the University of Delaware.

•••

R. SIDNEY MADISON has been appointed director of the corporate data center and ROBERT J. SANDLER has been named director of technical services for Grand Union Co.'s corporate headquarters in Elmwood Park, N.J.

Madison was previously director of information services for Mount Carmel Mercy Hospital. A graduate of Michigan State University, he earned a master's degree in business administration.

Sandler previously was manager of systems support for Pan American World Airways. He attended Columbia University.



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Interchange '82 Slated Oct. 25-27

HOUSTON — Interchange '82, the annual Perkin-Elmer Corp. Users Group meeting, will be held here Oct. 25-27.

Horace G. McDonnell Jr., PE's president and chief executive officer, will keynote the conference. Topics to be discussed at the event include Bell Laboratories' Unix, the use of computers at the Johnson Space Center in Houston and comparative evaluation of PE's OS/32MT and Singer Corp.'s Real-Time Monitor.

Registration for interchange '82 is $85. More information is available from PE's Data Systems Group at 2 Crescent Place, Oceanport, N.J. 07757.

Access to IRS Files Eased in New Tax Bill

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Restrictions on access to Internal Revenue Service (IRS) data bases have been eased through a provision buried in the lengthy tax bill just passed by Congress.

Approval of the provision culminates several years' lobbying by federal law enforcement authorities uncomfortable with IRS confidentiality laws. Besides making it easier to obtain access to individuals' tax records for investigatory purposes, the provision increases the number of government officials who can request such access and gives the IRS new authority to disclose, on its own initiative, certain types of taxpayer data to other government agencies.

The little-noticed or little-debated section of the new law, which amends numerous miscellaneous tax provisions, has in various forms been the subject of a series of congressional hearings over the past several years. The Justice Department argued that existing tax confidentiality regulations were administratively cumbersome and needed to be streamlined.

Former IRS officials told Congress the proposals would make the IRS a scout for law enforcement agencies and might discourage compliance with tax laws [CW, Jan. 11]. In addition, business groups worried that companies might be more liable to federal legal action.

But with proponents of eased tax file access arguing the changes were needed to help curb organized crime, the amendments won the support of the Reagan administration and had strong backing on both sides of Capitol Hill.

NTIA Told to Study U.S. Info Policies

WASHINGTON, D.C. — Congress has directed the National Telecommunications and Information Administration (NTIA) to conduct a study of long-term U.S. international telecommunications and information policies and goals.

In a recently approved bill authorizing NTIA expenditures for fiscal years 1983 and 1984, the agency was directed to conduct the study, focusing on the policies needed to achieve U.S. goals in the international arena.

A report on the bill, prepared by conferees who ironed out House-Senate disagreements over the authorization legislation, said that ascertaining the U.S. goals and policies is "of great importance" and called for a government structure that would "maximize the ability of the United States to realize its goals in international negotiations."

Congress expects NTIA "to play a significant role in the formulation of international telecommunications policy by the executive branch," the report said. In recent years, the State Department has been asserting leadership in developing and implementing international telecommunications and information policies, particularly in relation to bilateral and multilateral negotiations.

Calling for a "long-term strategy that will promote and protect U.S. interests," the bill also "admonished" the administration to avoid divulging to foreign telecommunications authorities any information developed in the NTIA study that could be used against American companies doing business abroad.

Washington Update

Citicorp DP OK Extended To All Bank Companies

WASHINGTON, D.C. — The Federal Reserve Board has approved expanded data processing and transmission services by bank holding companies following a similar approval for a new Citicorp DP subsidiary.

The amendment to banking regulations will go into effect later this month. The Aug. 20 ruling will allow bank holding companies to offer such services as time-sharing, electronic funds transfer, home banking and data base access. The regulation stipulates that the data processed must be financial, banking or economic and that any hardware offered must be incidental to these services.

Citicorp's proposed Citishare subsidiary plan was approved July 9 by the Fed following the recommendation of a federal administrative law judge who heard arguments for the proposal by Citicorp and counterarguments from the Association of Data Processing Service Organizations, Inc. (Adapso). Adapso maintained that the proposed services are not closely related to banking activities and are, therefore, contrary to banking laws and regulations.

The administrative law judge found otherwise, however, and the Fed, with some changes, adopted his recommendations to approve Citishare and amend the banking regulations accordingly.

Adapso has appealed the Fed decision in federal court here.

New mbp COBOL Compiler for CP/M-86 cuts run-time 75%! Or your money back!

Compared to interpreters, mbp's new COBOL Compiler for CP/M-86* cuts 16-bit micros' program run-time 75%! With it, in one hour you can now run programs that used to take four. Put another way—it's like having four computers for the price of one. The dollar savings are obvious—and, awesome!

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Tracks Cargo Worldwide

Air Freight Firm Spreads Its Wings With Net

By Bob Johnson
CW New York Bureau

WILTON, Conn. — What began as a simple DP system in 1969 has grown into a sophisticated air cargo tracking network that Emery Worldwide claimed is the only direct computer-linked system of its kind available to shippers all over the world.

Progressing from an IBM 360/30 CPU in the late '60s and then through an IBM 370/145, an Itel Corp. AS/5 and currently a battery of IBM 4341s, Emery said that its Emery Control (Emcon) system can now pinpoint the status of air cargo carrier and forwarder shipments anywhere around the globe, 24 hours a day, seven days a week.

The Emcon network, which includes users such as Data General Corp. and Boeing Co., allows access to the system from CRT terminals located in 23 worldwide Emery offices and at large-volume customer sites.

In North America, customers can get into the network through Telex and TWX terminals as well. The company said that the network includes nearly 650 CRT terminals and printers installed at its 120 locations throughout North America and another 170 in 63 locations internationally. Most of the terminals on the system are dumb devices, largely Digital Equipment Corp. Decwriter LA 36s, Emery noted.

Modified Package

Emcon's operating system evolved from an IBM telecommunications package originally designed for the brokerage industry in the '60s. Emery said that its DP staff completely modified the Communications Control Applications Program (Ccap) to meet the special requirements of an air freight tracking and tracing system and boasts a worldwide response time of two to three seconds.

North American transmissions on the system operate in asynchronous mode at speeds ranging from 15 to 240 char./sec. International transmissions are sent synchronously at speeds of 30 to 240 char./sec.

Operating out of the company's headquarters here, the system is driven by an IBM 4341 Model 2 CPU, one of four at the data center. Emcon links all of its peripherals to the CPU through a mixture of high-speed concentrators, including IBM System/7 and Series/1 units. Frequency-division multiplex, statistical-division multiplex, leased lines, satellite and microwave channels are used to transmit information as well, Emery said.

Another 4341, normally dedicated to batch processing, doubles as a backup for the Emcon system and allows a switchover of less than five minutes, Emery noted. In addition to redundant switching, data is fully redundant, with information stored on more than one physical device on a real-time basis.

How It Operates

Emery explained how the system operates. When a shipment is received, it is assigned an airway bill number, which is logged into the system along with the name and address of the shipper and consignee, as well as other necessary shipping data. As the package moves toward its destination, Emery operators monitor its flow while updating such information as flight departure times and delivery truck routes. Complete information on any shipment is then available at any system terminal.

Emery maintained that even if a customer does not know the shipment number, it can be obtained by cross-referencing other specific information about the shipment, such as its destination or consignee's name.

The system is also capable of calculating rate quotations for customers who are undecided about using Emery services for a particular shipment. For international traffic, rate quotations can be provided in more than 50 currencies, the company pointed out.

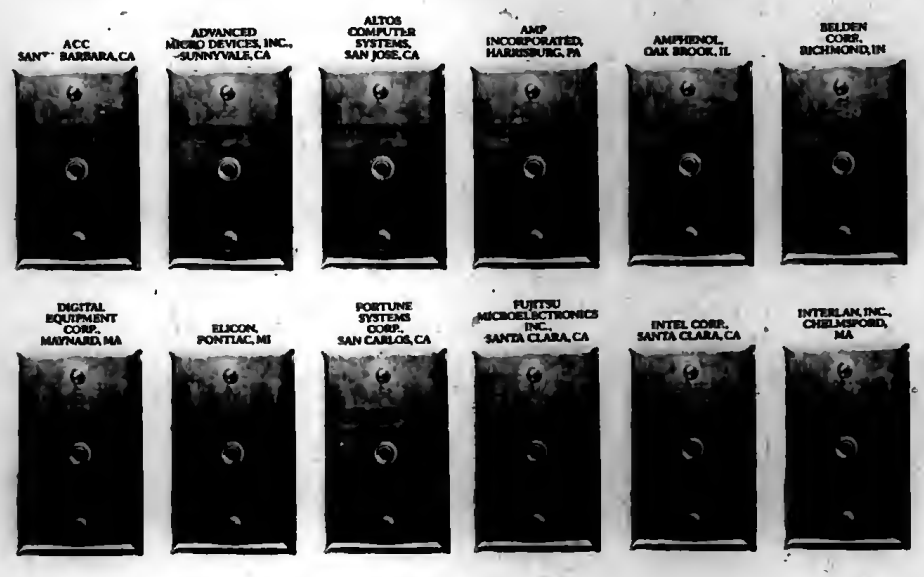
Another Feature

Another feature of the system, according to Emery, is its specialized "Superscan Report." Customers or Emery management can request these reports, which extract information from the Emcon data base during off-peak hours for analysis.

William F. Somers, Emery's director of information systems development, said that, as an example, these reports can be customized by shipment types, origin or destination — over any time frame and in flexible formats. Emcon-generated data other than Superscan is also used by a number of other Emery divisions, such as its Accounts Division, which processes about 30,000 invoices daily, the company noted.

Plans for providing users with more flexibility and data manipulation are in Emcon's future, according to Emery. The company revealed that its Information Systems Department is currently converting its Ccap operating system to IBM's MVS system with CICS and is working on installing Systems Network Architecture.

THIRTY COMPANIES PLUG ETHERNET.



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Programming Therapy Aids Analyst to Regain Memory

SHAWNEE MISSION, Kan. — One Sunday in May 1981, Darrel Hagstrom climbed on his brother-in-law's motorcycle for a brief fun-ride. Moments later, he narrowly escaped death when the brakes locked, throwing him to the pavement.

The 36-year-old systems analyst, in a coma with a serious head injury, underwent surgery in which part of his skull was cut away to relieve pressure on his brain from a blood clot. Hagstrom came out of his coma three days later to find he was not exactly the same person as before.

"I was in pretty bad shape," recalled Hagstrom, an employee of Sperry Univac for more than 10 years who had been presales manager of the Univac Shawnee Mission branch. "I had lost part of my memory. I didn't know where I was, why I was there. I also had a hard time moving my left arm."

With his faculties severely impaired, Hagstrom began a long, difficult climb back to intellectual proficiency. The hospital's special therapy program for Hagstrom, however, was not working.

"Therapists don't really understand the world of DP," explained Carol Worden, presales manager in Univac's Minneapolis branch, who had been Hagstrom's first software instructor in 1969. "It's hard for them to develop meaningful therapy — everything they were giving him had no reasoning behind it.

Darrel Hagstrom uses Mapper software as Carol Worden watches.

"He seemed to need motivation more than anything else," she recalled. "He remembered me, but very little about his job. It was only when we said, 'Let's work with what he's familiar with and get him back into the mainstream' that he started to respond well."

Worden suggested that "we give him problems, things to work on so he would feel productive. Only by feeling productive would he realize his value again."

The head of the therapy department agreed that Hagstrom needed a new psychological approach based on the surroundings and experiences of the "real world" to which he had been accustomed. Only then, it was felt, could he begin climbing out of the mists that enveloped him.

Two-Part Therapy

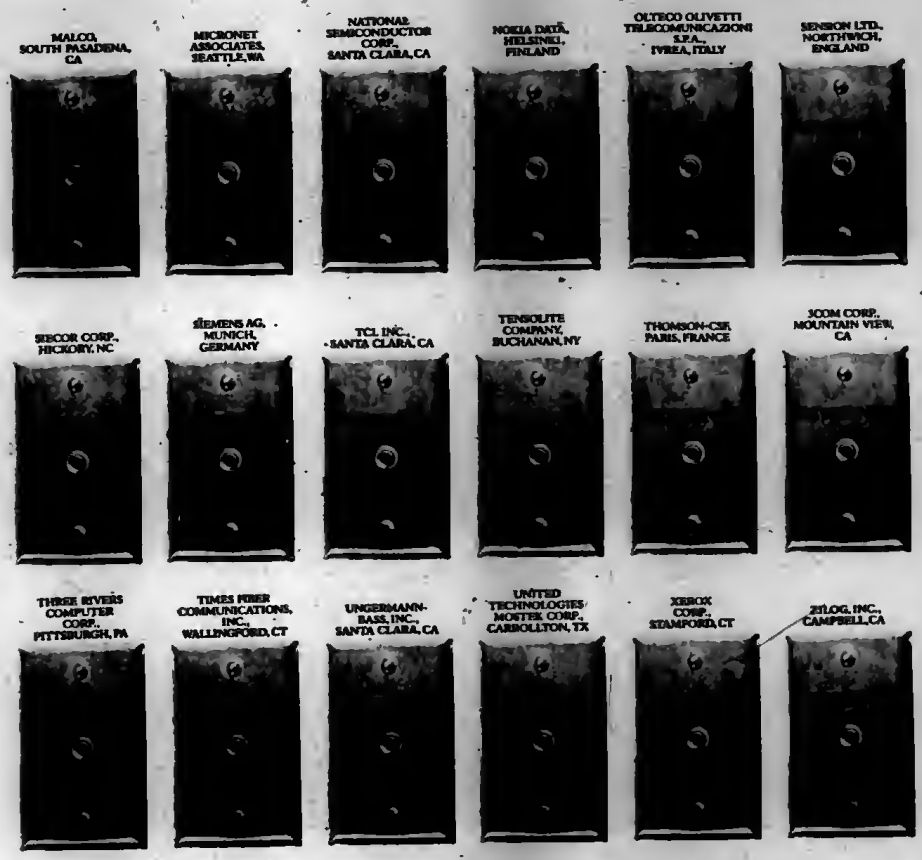
With the hospital's approval, Hagstrom began a two-part therapy: at the hospital in the morning and the Minneapolis branch of Univac in the afternoon. For Hagstrom, the "real world" was the branch, with Univac people, a Uniscope terminal connected to a Series 1100 computer in Roseville and the firm's Maintaining, Preparing and Producing Executive Reports (Mapper) software, which he had previously used to build applications.

"I had been very familiar with Mapper before the accident," Hagstrom said. "Things started coming back as Carol and I worked with it on the office terminal. I was glad I had a chance to prove I could get back to Univac and relearn things."

Slowly but steadily Hagstrom improved. In September, the doctors decided that all his therapy should take place at Univac. By the end of October, he was going in by himself to be met at the bus station. By November, Hagstrom was again adept at using a keyboard with Mapper.

Hagstrom had lost "some of his abilities," according to Terry Elliott, a presales systems analyst in Minneapolis, who helped Hagstrom with advanced and new Mapper techniques. "In using a program language, for instance, he had been an expert. Now he would have to experience and relearn certain things."

On May 24, exactly one year after his accident, Hagstrom returned to Shawnee Mission as a regular employee — a data processing consultant working on software. "I thank the world of Sperry Univac," Hagstrom said. "I want to help it and the people who have helped me."



So far, 30 companies have announced they're making products that are compatible with Ethernet. And over 250 others have asked for applications to do the same.

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Digital Big Brother

Sassy Program Keeps Programmers in Line

By Tom Henkel
CW Staff

PITTSBURGH, Pa. — Thanks to the marvels of technology, computers can now be taught to torment their users.

Researchers at Carnegie-Mellon University (CMU) here and at the University of Pennsylvania in Philadelphia have created a program that will, in effect, tell a programmer when he is falling down on the job. The program was presented in one of 96 papers at the National Conference on Artificial Intelligence held here recently.

Tact is not a feature of the program, according to its developers. A programmer may be plugging away at a terminal, minding his own source code, when two pages worth of instructions suddenly flash on the screen. The instructions inform the programmer how the code could be rewritten to perform more efficiently.

"It's incredibly obnoxious," said Jeff Shrager, a graduate student at CMU who, along with Tim Finin, an assistant computer science professor, originally developed the malcontent program as part of a master's degree project.

Shrager used a Digital Equipment Corp. VAX-11/780 processor at the University of Pennsylvania to write the program in Lisp, a programming language that has been used by artificial intelligence aficionados. The program interacts with VAX's VMS operating system.

Tha idea is, Shrager said, that programmers who need help often do not realize it. And when they finally figure out that help is needed, they often do not know what areas require aid. Tha program's bombastic style, however, often generates more ire than gratitude, Shrager said.

Most computer systems have some expert help facility that is offered to the programmer by inputting "HELP" or some other indicator. Some systems let the user thrash around making mistakes for a while and then explain that there is a help package. What the CMU and University of Pennsylvania researchers wanted to do was take the expert help function and giva it some intelligence, Shrager explained.

Intelligence Added

The result was a program that watches over everything the programmer does and chimes in with suggestions whenever the victim strays from some predefined rules.

The original program simply took control of the screen whenever the rules were broken, the CMU graduate student said. Finin is currently working to give the programmer the option of looking at the program's words of wisdom or simply ignoring them.

As an example of how the program works, Shrager cited three commands: COPY, RENAME and DELETE. One way of giving a file a new name is to copy its contents into a new file and deleta the original. A more efficient way is to use the RENAME function. If a programmar were caught using the COPY and DELETE method, the program would mention there is a RENAME command and explain how it is used.

Right now, the research project is aimed only at programmers, but the implication is that similar programs could be developed for anyona who has to deal with a computer.

However, there is some good news for those who do not like the idea of a digital big brother. Tha Shrager and Finin program is admittedly inefficient and breaks some of its own rules. Shrager said there was a one-time plan to have a CMU graduate student clean up the program, but so far, that has not happened. Furthermore, Shrager said that it will take at least another year of research to finish the project.

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Neighboring Firms Make Pact To Share Systems During Crises

EVANSVILLE, Wis. — One Thursday in March 1981, his system down, Baker Manufacturing Co.'s DP manager was sweating out how his department could process 200 weekly payroll checks before that evening's deadline.

"By 6 p.m. we still hadn't input data for the week's payroll," Robert E. Richter recalled. "The nearest NCR facility that could process our payroll was in Dayton [Ohio]. Transporting our people there in a matter of hours was impractical. So, in desperation, I started calling other NCR users in the area.

"We had already made arrangements to have our payroll processed by a user about two hours away," he added, "and our people were packed to leave when NCR specialists, who had flown in from Rancho Bernardo, Calif., got our system up and we were able to complete the payroll."

That close call — the result of problems encountered during an operating system conversion — shook Richter. Though serious downtime problems had not plagued the firm, a user of an NCR V-8550 processor, before or since the conversion, Richter decided his company could not afford to be complacent. It needed a backup plan.

Backup Plan Needed

"Admittedly, the odds that hardware problems will shut us down for several hours are slim," Richter remarked. "Our on-line uptime is better than 99%. But because of the severe consequences of losing critical on-line systems for an extended period, we decided it was prudent to invest in the development of a backup plan.

"For example, every day 75 people depend on our on-line foundry scheduling system," he noted. "The effort hasn't proved that time-consuming either. I'd estimate we've invested less than 40 hours in our plan."

The cornerstone of Baker's plan is an agreement with Sisters of Sorrowful Mother Hospital to back up each other's critical on-line systems during emergencies. Sisters of Sorrowful Mother, located in nearby Milwaukee, has a similar NCR configuration.

Many factors must be considered in developing a mutual aid pact, according to Richter. But the first requirement is finding a nearby user with compatible hardware and operating software that is willing either to turn over its system or share access to it during prime on-line hours. For Baker, these hours are 7 a.m. to 5 p.m.

Baker and Sisters of Sorrowful Mother have agreed to share their systems during crises, since neither can afford to shut down its own on-line operations to accommodate the other. They also decided to use a combination of telephones, data sets and communications lines to link their systems, rather than attempting to transport the people and documents necessary to input data as well as operate from the backup site.

During the on-line day, Baker's backup partner will provide three NCR 658 disk units, one tape unit and a 4,800 bit/sec asynchronous communications adapter to load one on-line job for communications.

(Continued on Page 18)

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Seminar Targets Systems Planning

NEW YORK — IM Computer Services, Inc. is offering a three-day seminar here on "Strategic Systems Planning" Sept. 14-16 and again Oct. 26-28.

The seminar is said to offer a proven methodology that unites the efforts of business and systems planners in utilizing rapidly developing technology in user-oriented systems. Case study activities allow small teams of participants to apply the methodology and present their plan for assessment.

The registration fee is $650, IM Computer Services said from 230 Park Ave., New York, N.Y. 10169.

Neighbors Share Systems During Crises

(Continued from Page 17)

According to Richter, the backup arrangement is feasible because Baker is asking its partner to back up just two on-line systems. The users decided from the start that they would not attempt to run batch work on one another's systems during the on-line day.

"My department supports six on-line systems," Richter explained, "but Sisters of Sorrowful Mother can only spare the system power for us to load one on-line job at a time. This meant we had to decide which of our on-line modules were truly critical. We identified two, but since they have the same hardware requirements, we can load the second as soon as the first is completed."

In deciding which on-line jobs were vital, Richter examined the consequences of extended downtime on end users. From its base here, the Baker DP department supports 24 on-line terminals located in Evansville offices, a Milwaukee manufacturing facility and 14 wholesale distribution houses in the Midwest.

Of Baker's six on-line modules, Richter immediately crossed off an on-line program development system and a testing module as nonessential. But once those modules were deleted, the choices became more difficult.

Eventually, the DP manager decided to forfeit backup of a wholesale outlet system. While outlets rely on this on-line data collection system to maintain an 80,000-item inventory control system and to process purchase orders and accounts receivable for some 6,000 customers, Richter decided operations would be near normal without the system for a period of days.

Look at Alternatives

"You have to look at the time frame, what the system is doing and what alternatives exist for processing the work," he said. "It's highly unlikely we would ever be down for more than one or two days. For this length of time, wholesale outlets could manually check inventories and write purchase orders. Even if we lost the accounts receivable system near month-end, we could go ahead and process by just omitting invoices for the last few days."

Similar reasoning led Richter to delete an on-line manufacturing system providing payroll data and maintenance for bills of material and costing modules from the backup list. "While the payroll portion could be critical, we can use existing card equipment to input data to the payroll system and produce payroll checks in a crunch," he noted.

Such options didn't exist for a manufacturing system that incorporates on-line incentive payroll, foundry scheduling, costing, finished goods order entry and inventory control.

Identical Requirements

After completing this needs analysis, Richter defined what hardware was needed to support Baker's critical on-line systems. Fortunately, the two manufacturing systems proved to have identical requirements.

Next, Baker and Sisters of Sorrowful Mother compared their configurations to determine if there were hardware differences that would pose shared-access problems. Different approaches to communications turned up one roadblock. It was solved when Baker found an asynchronous/synchronous converter to enable the company to communicate with its partner's 4,800 bit/sec synchronous data phone.

Even though both sites are using NCR's VRX operating software, the organizations realized study was needed to ensure they would not bring down one another's systems when sharing access in an emergency. As a result, the users agreed to synchronize their timing on release upgrades. They also sought the aid of NCR's service organization regarding modifications.

"NCR has been very cooperative," Richter said. "We had a meeting with the NCR district manager and the account managers and site engineers for Baker and Sisters of Sorrowful Mother. NCR agreed to communicate any modifications applied to hardware or firmware patches and upgrades at one site to the other as quickly as possible."

Finally, Richter pointed out, all elements of the plan were written into a comprehensive contingency document that spells out what each party must do if there is a system failure.

"Of course, this document must change as our systems and needs change," he noted. "We plan to review our procedure for all activities from the loss of the primary facility to recovery on the backup facility every six months."

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Communications Seminars Set for Various U.S. Cities

ORANGE, Calif. — The Center for Advanced Professional Education (Cape) has released its fall schedule of communications seminars slated to take place in various U.S. cities.

"SNA/Teleprocessing Access Methods" is a three-day course that will focus on the evolution of data communications software. It will be conducted in Palo Alto, Calif., Sept. 22-24 and then in Somerset, N.J., Oct. 27-29.

"Satellite Communications and Network Design" will cover network technology and concepts, including the use of satellites in networks, mixed networks and interconnection. This program is being offered Oct. 18-20 in New York and Oct. 25-27 in San Francisco.

"Design and Management of Local-Area Networks", reportedly will span the evolution of local networks, network technology and the leading commercial products currently available for the design and implementation of local-area networks. It will be held in San Francisco, Oct. 25-27; in New Brunswick, N.J., Nov. 8-10; and in Detroit, Nov. 15-17.

The registration fee for each of the three-day seminars is $595. Additional information is available from Cape at 11928 N. Earlham, Orange, Calif. 92669.

Course to Focus On Designing SNA Networks

ANDOVER, Mass. — Communications Solutions, Inc. is sponsoring a three-day seminar here Sept. 13-15 entitled "SNA Architecture and Implementation." It will also be held in San Jose, Calif.; Dallas; Chicago; and Boston over the next year.

The material provides data communications professionals with the working knowledge needed to design Systems Network Architecture (SNA) networks and evaluate SNA-compatible products. The seminar was designed for network designers, systems programmers, technical managers, product planners, systems analysts and others involved with SNA.

The major emphasis will be on examples of how various protocols are used in existing SNA products to control end-user-to-end-user communications.

The registration fee is $650. Communications Solutions said from Suite 205, 10062 Miller Ave., Cupertino, Calif. 95014.

Video Courses Cover IBM 3081

AVON, Conn. — A self-study video training package designed to instruct data center personnel on the fundamentals of operating IBM's 3081 is now available from Computer Systems Research, Inc. (CSR).

The packet reportedly contains 10 courses on 17 videotape modules. Course titles include "Computer Numbering Systems," "370/3081 System Architecture Overview," "3081 Hardware/Software/Firmware," "3081 Real and Virtual Storage Concepts and Utilization," "3081 Interrupt Processing," "3081 Multiprocessing," "The 3081 Console Complex," "The 3082 Processor Controller," "3081 System Initialization" and "3081 Problem Status Recording."

The courses are priced at $1,500 each or $9,600 for the complete package.

More information is available from CSR, Avon Park S., 40 Darling Drive, Avon, Conn. 06001.

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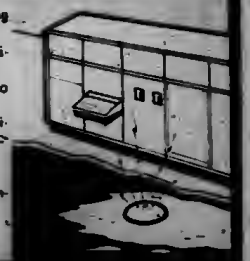

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Software Development Theme of Nov. 15 Forum

SILVER SPRING, Md. — A forum on "Managing Software Development" will be held at the Hyatt Regency Crystal City in Arlington, Va., Nov. 15-17.

Sponsored by the School of Government and Business Administration of George Washington University (GWU), the conference will provide an opportunity for management information systems directors and project managers to gain an up-to-date perspective on the tools, techniques and methodologies for applications development.

The first two days of the conference will feature presentations by leading authorities on the subject. The third day will be devoted to executive briefings for establishing a quality-assurance program and using automated project management systems.

The fee for the conference is $695, with a reduced price of $645 for participants who pay prior to Oct. 15.

For further information, contact the GWU Systems Executive Forum, U.S. Professional Development Institute, 12611 Davan Drive, Silver Spring, Md. 20904.

Guide Covers Contracting

WASHINGTON, D.C. — Software conversion can be a slow, laborious and expensive process, but well-planned use of contractor services could bring substantial benefits for this task, according to a new report from the U.S. Department of Commerce's National Bureau of Standards (NBS).

"The Guide to Contracting for Software Conversion Services" attempts to familiarize federal DP managers with actions that should be taken to ensure a successful conversion.

The guide, publication number SP 500-90, is available for $4.50 prepaid from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Order by stock number 003-003-02393-1.

DSSD Meet Set for Oct. 4

TOPEKA, Kan. — The theme of the 7th Annual Data Structured Systems Development (DSSD) User's Conference is "Automating the Development Process." The event, dubbed Feedback '82, is scheduled to take place here Oct. 4-6, according to conference sponsors at Ken Orr and Associates, Inc.

DSSD is the methodology offered by Ken Orr and Associates, and its users will convene to discuss major DSSD projects being carried on by organizations throughout the world. Speakers will be on hand from Hitachi Ltd., IBM, Quantitative Software Management, Inc. and Exxon Corp.

Conference registration is $500. Further information can be obtained from Ken Orr and Associates, 715 E. 8th St., Topeka, Kan. 66607.

Training Courses Offered on IBM 'ADF'

ROCKVILLE CENTRE, N.Y.— Babb Computer Associates, Inc. is offering a series of training courses for IBM's IMS Application Development Facility (ADF).

The courses include a four-day ADF basic workshop, ADF special features and an ADF overview for managers.

The classes are taught in-house with hands-on experience. Fees for the courses vary.

Further information on the courses is available from Babb Computer Associates, 333 N. Village Ave., Rockville Centre, N.Y. 11570.

Blumenthal to Keynote International Info Systems Meet

ANN ARBOR, Mich. — The Third International Conference on Information Systems will be held here Dec. 13-15. Keynoting the conference will be W. Michael Blumenthal, chairman and chief executive officer of Burroughs Corp.

The conference is sponsored by the Society for Management Information Systems and the Institute of Management Sciences in cooperation with the Association for Computing Machinery, according to a release.

Twenty-seven papers have been selected and will be presented at the December conference. These papers have been divided into the following categories: information system technology and design, information system implementation and use, managing the information processing function, the impacts of information systems on organizations and society and innovative information systems curricula.

Fees for the conference are $125 for academics and $250 for nonacademics.

Further information is available from Carol Dunn, Information Systems Research Group, University of Michigan, Ann Arbor, Mich. 48109.

Northern Telecom brings

Norwegian Shipper Combines Systems

In-House DP Goes Worldwide With Service

Special to CW

ROCKVILLE, Md. — A leading management company in Norway has integrated the capabilities of in-house computer systems with those of an external teleprocessing service based here. In the process, it said, it has achieved data processing efficiency and economy.

Norway boasts a long and admirable history of conquest on the seas dating back to the days of the Vikings. But for the Hoegh Group, a leading Norwegian fleet managing company, the answer to today's demanding and complex marketplace is a combination of modern vessels, qualified personnel and the enhancement of its in-house data processing by General Electric Information Services Co.'s (Geisco) international Mark III Network.

This shipping company, which has withstood 50 years of international maritime changes, is headquartered in Oslo, Norway, with branch offices in Paris; Le Havre, France; Hamburg, West Germany; London; New York; San Francisco; Houston; Lagos, Nigeria; and the Middle East. In addition, Hoegh has a worldwide network of independent agents.

Since its humble beginning in 1928 with ownership of only two tankers, Hoegh has followed a policy of diversification and today is engaged in various activities of the shipping industry including liner services and transportation of cars, gas, oil and dry bulk cargoes.

Leif Hoegh & Co. A/S, the managing company of the group, operates a diversified fleet averaging 60 vessels with a total freight revenue of about $550 million and an active building program for 13 new vessels.

One of the major car carriers worldwide is Hoegh-Ugland Autoliners (Haul), jointly owned by Hoegh and another Norwegian shipping group. Haul operates more than 20 car carriers, transporting about 500,000 cars annually all over the globe.

How does the Hoegh Group cope with all this complexity? Through the wise management of its quality fleet, competent personnel and its combined information systems.

When queried about this combination of in-house data processing and outside computing service, Tormod Skau, assistant director of administrative services, who is responsible for the information processing function at Hoegh, explained: "We are in the shipping business, not the data processing business.

"My job has been to provide efficient application packages and computer processing facilities for end users, keeping the number of systems designers and computer operators at a minimum," Skau continued. Ready-to-use products offered by computer service centers have, therefore, been a logical choice.

"For example, we do not have time to build systems from scratch. A container line was started some years ago and we had five months to come up with a container tracking system. The only sensible option was to look for a ready-to-use package.

"Another instance occurred," Skau

(Continued on Page 22)

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Norse Firm's DP Goes Worldwide With Service

(Continued from Page 21)

recalled, "when our IBM computer had been loaded to capacity. There simply was no room for additional work."

Through Geisco's affiliate in Norway, General Electric (USA) Information Services A/S, Mark III service is made available to The Hoegh Group and performs as a natural extension and contribution to its in-house data processing system.

The Hoegh Group selected Mark III Service for several reasons, the most important one being the international network, according to Skau. "Our ships are trading worldwide," he said. "We have a worldwide agency network and branch offices and subsidiaries scattered all over the globe. We need a worldwide computing network, and Mark III Service gives us just what we need.

"Our programs are available when and where they are needed and no investment in hardware and a network is necessary. We think this flexibility is important for an industry in which trades may be opened and closed at short notice," Skau added.

The DP center at Hoegh's headquarters is linked to Mark III Service, giving the end users the option to access it or the in-house computers from their terminals. One of five persons at headquarters has a data terminal at his desk. Stand-alone word processing machines are also linked to the same internal network and may function as data terminals.

"The way Mark III Service interacts with our in-house system has been very beneficial to us," Skau said. "It is used as an extension and works daily in conjunction with our in-house system.

"Each day, the in-house computer receives input produced by the service via high-speed data communication lines," he explained. "Conversely, the service receives data from the in-house computer." A number of applications have been implemented on this joint system including a budget and accounting system, a portfolio management program and a capital expenditure program.

Help for 20 Companies

Mark III helps provide financial reports for about 20 companies, according to both Norwegian and U.S. accounting standards.

The preparation of comprehensive financial reports and the consolidation procedures were previously time-consuming and created some problems. To address these problems, Hoegh's financial accounting people and Geisco's Norway-based technical people designed and implemented a financial reporting package on Mark III Service.

"It is a relatively simple system which edits; consolidates and reports financial statements for quarterly reports, annual reports and tax declaration; and documents for the auditors," Skau explained. "The financial data used by the system is transferred from Hoegh's in-house computer and stored in a Data Management System (DMS) II data base on Mark III Service.

"The reports are defined by means of three files: a text file, a logic file for calculation rules and a file for consolidation rules. The system helps make possible faster production of financial reports with a higher degree of accuracy," he added.

Hoegh also makes good use of a large collection of application packages available from Geisco, including the Currency Exchange Data Base, the Securities Data Base, the Statsystem for statistical analysis, DMS II data management system and Plot II plotting and graph-producing package.

Another special feature of Mark III Service is the library of independently authored software called Network Software Services (NSS). NSS programs, proprietary products of the authoring firm or individual, reflect the knowledge and experience of those authors covering many disciplines.

NSS programs used by Hoegh include Marinfo, a system from Marine Midland Bank for world money market information. Hoegh also obtains data concerning ships, charter fixtures and tanker casualties from an NSS program from Maritime Data Network Ltd.

Hoegh is planning to link all of the computer systems of the agents to the Mark III Network. Both the agents and headquarters systems will then interact with Mark III Service.

Skau is also considering a number of future applications that will help to give better and more streamlined control over day-to-day management.

Communications from vessels via satellite has been tested by Hoegh for some time. "Satellite communications with the vessels opens new possibilities for information processing and communications," Skau said, "and Mark III Service is being considered to handle reporting from the vessels."

Another area on Hoegh's current list of future applications is freight documentation routines that today create a lot of problems for the shipping industry. Use of Mark III Service in this area could speed up the transfer of information between agents, eliminate double entry of transactions, reduce the vast amount of paper created, give more reliable information and reduce the cost.

To Deal With Heavy Product Demand

Process Control Firm Finds Handle With Minis

MARSHALLTOWN, Iowa — A minicomputer system is monitoring worker efficiency, tracking the incentive pay program and overseeing production for a booming process controller manufacturer here.

Fisher Controls Co., a firm that produces valves, regulators and controls, has been operating three shifts a day, six days a week to keep up with industry's demand for process control systems.

The firm's computer system has greatly improved machine-shop operations while also managing a large-order and transaction-processing load, according to Jerry Trout, distributed systems manager.

"We were looking for a computer system that could monitor worker efficiency, keep an eye out for lost or missing tools, manage 16,000 transactions a day and maintain full records and routing data on more than 24,000 open shop-orders," Trout said.

Tall Order

"As a company that markets process controllers of all types, we are very familiar with existing computer technology, and, of course, we realized that we were placing a tall order," he added. "We were also asking for a computer that could do everything with no more than a few minutes of downtime in the event of a 'worst-case' failure during a shift."

After considering systems from Hewlett-Packard Co., Data General Corp., General Automation, Inc., Digital Equipment Corp. and IBM, Fisher selected HP as its supplier because of its "total software support," Trout reported.

For "fail-safe" operation, two HP 3000 Series III computers were configured to automatically shift the terminal load to the operating machine in the event of a failure in one. When not in the emergency mode, the backup HP 3000 was set up to aid administrators and to assist in-house programmers with software development.

With more than three years of successful operation behind it, Trout is full of praise for the system's reliability:

"The only sustained downtime we've had was when a truck ran into a utility pole and knocked out power to the entire plant — neither system could operate. When power was restored, the computers started up automatically, without operator intervention," he said.

To maintain high productivity from workers, Fisher has for many years operated under an incentive-pay system, which necessitates an efficient work reporting system to keep track of productivity and to calculate worker incentive pay.

"Our previous badge- and card-based data-collection system was cumbersome to work with, and payroll regularly had to correct entries because of reporting and software errors," Trout noted.

"Also, shop order status was manually posted on cards. Because of the lag time in posting, it was difficult to determine the current status of an order," Trout said.

There were other reasons for switching to a more powerful computing facility. For example, in the plant tool crib, keeping track of thousands of drills, jigs, fixtures and other tools was done manually.

"Keeping track of tools was becoming a real problem," Trout recalled. "We even had production slowed down when workers could not find tools which had been checked out by other workers."

Additional Problem

An additional problem was that customer-service personnel at one end of town had to spend hours on the phone with plant personnel to locate parts scheduled for assembly and delivery to customers. It was hoped that a more automated system would allow individuals at both ends of this connection to get more work down.

"Hewlett-Packard offered us a complete solution, from the HP 3000 computers to the HP 2640 CRT terminals used for work reporting and the HP 3076 badge- and card-reading terminals used in the tool crib," according to Trout.

Two HP 3000 computers, each with 2M bytes of main memory and 64 synchronous I/O ports, were installed to support in-plant DP functions and to interface with the corporate computer system. Disk storage in each machine consists of two 50M-byte and three 120M-byte hard disk drives.

One HP 7970E tape drive does continual logging for restoration in the event of an outage, and two other tape drives are used for utility purposes.

For work reporting, 17 HP 2640 CRT terminals are strategically located near workstations on the production floor. Data on tools borrowed from or returned to the tool crib, meanwhile, is recorded on four HP 3076 data capture terminals in the tool crib.

About 30 additional HP CRT termi-

(Continued on Page 24)

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Q SOLUTIONS, INC.

Large Trust Fund Finds Benefits Managed Best With Interactive DBMS

SAN FRANCISCO — What does the seventh largest trust fund in the U.S. look for in a data base management system (DBMS)?

To help manage the retirement, medical, vacation and fringe benefits of all unionized carpenters in 46 northern California counties, the Carpenters Trust Fund (CTF) of San Francisco needed an interactive DBMS. Technical staff members were running into problems in CTF's IBM 4341 environment because contractor and laborer data was kept on separate Isam files and cumbersome CICS screens had to be developed in order to generate reports.

Specifically, the CTF DP department set out to find a DBMS that offered:

- Inverted list structure.
- Relational capabilities.
- Flexibility.
- Ease of use.
- Ability to interact with CICS.
- Simple screen capabilities.
- Strong reporting facilities.
- Vendor-supplied education and support.

"Since all future goals and objectives of systems development depend on the processing techniques of a DBMS, the first priority was to establish that environment at CTF," said Jack Matteo, assistant DP manager at CTF.

Product Choice

The products that Matteo considered included Intel Corp.'s System 2000 DBMS; Applied Data Research, Inc.'s Datacom/DB; Cullinane Database Systems, Inc.'s IDMS; Software AG's Adabas; Cincom Systems, Inc.'s Total; and International Data Base Systems, Inc.'s Seed. The final decision, in August of 1981, was in favor of Intel's product, and Matteo launched his staff into the vendor's training program.

"The project programmers and myself took nearly all of Intel's System 2000 courses over the period of six weeks, all the while bouncing design ideas for our data bases back and forth between ourselves," Matteo explained.

"About a month after the last course, we had all three of our planned data bases loaded, and two weeks later we had our first interactive screens up. All in all, from installation to production, it took four months to complete our first application."

Four Data Bases

The application system included four massive data bases: an employer data base containing information on the 32,000 employers of carpenters in northern California, an active employee data base containing data on 81,000 carpenters and active pensioners, an inactive employee data base consisting of 57,000 inactive carpenters and a contractor data base with detailed information on 222,000 contractors, which covers all licensed contractors in the state, according to Matteo.

For each name in the contractor data base, information includes the names of all current employees, beginning and ending dates of employment, agreement specifications, liability records and employment histories.

At the end of each month, CTF must send each of these contractors a report, itemizing all carpenters who worked for them that month. After each contractor updates the report, they return it to CTF with payment to cover the cost of those employees' benefits for that period, according to Matteo. This process will now be automated by the System 2000, and the employer need only verify terminations and update hours worked, Matteo said.

Compliance Department

The Compliance Department at CTF, which collects payments and reconcifes any discrepancies, now has data on contractor payment histories via CRT terminals that it never had before. This reportedly simplifies their work and enables them to concentrate on true problem accounts, according to Matteo.

The CTF has 80 IBM 3279 terminals up and running, 60 in-house and 20 in-field union offices. There is also a planned increase in the use of System 2000's Report Writer and Quest language, Matteo claimed.

"The Sacramento District Council and CTF Compliance section had been asking for a system like this for seven years. We delivered in seven months. That speaks for itself," Matteo concluded.

Minis' Power Drives Plant

(Continued from Page 23)

nals are used by managers and customer-service personnel for on-line inquiry and response transactions. Additional HP terminals are used by in-house programmers to develop new applications.

In addition to the terminals, the HP 3000s support two 600 line/min printers for report generation, HP 2635 and HP 2631 dot-matrix printers for management personnel and several 300 bit/sec printers to alert foremen of production difficulties.

Within five months of installation, the on-line work-reporting system was being used by 700 of Fisher's production workers.

Fisher runs more than 50 critical in-house applications programs daily, supporting on-line transactions as well as batch jobs.

Complementing Fisher's in-house programming efforts are several HP software tools. Programmers find that Image/3000, the HP data base management system, which allows information to be related logically among data sets of files, greatly simplifies their job. Programmers also use Query/3000, an English-like interactive inquiry language for special requests and program testing.

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Data Entry Decentralized

Manufacturer Manages Growth With System

ODESSA, Texas — Woolley Tool and Manufacturing, a division of Chromalloy American Corp., ships thousands of mud pump pistons, valves, pump liners, pipe tongs, elevators and other drill pipe handling gear to independent drillers and jobbers from the Gulf of Mexico to Prudhoe Bay in Alaska. With current annual sales tipping the scales at $47 million, the division turned to a new computer system to monitor its manufacturing processes and to help manage its growth.

Claiming that the heavy equipment company outgrew its IBM System/3 Model 15 within six months of its installation, Woolley in September 1980 bought a Sperry Univac 1100/60 computer system with 2M bytes of core storage, eight 8450 disk drives, two 5046 controllers, four U 36 tape drives and almost 100 UTS 400 terminals. "When we selected the system, we didn't look at hardware, we looked at solutions to our problems," recalled John Confer, manager of data processing at the company.

Confer said Woolley picked Univac over three other vendors because of its Unis and Mapper application software, Unis, the manufacturing control package, helps run the Woolley plants, according to Confer. Mapper, the acronym for Maintain, Prepare, Produce Executive Reports, reportedly puts the capabilities of Unis and the 1100/60 into the hands of users who have no prior computer training or experience.

DP Decentralized to Users

"Our old system was centralized in data processing," said Confer. "Now data entry and retrieval are decentralized to each department where users are trained to write their own programs using Mapper ... We've eliminated the need for system and software analysts and programmers, increased our efficiency 25%, plus our costs have dropped." Today, he claimed, the group's total DP costs are less than 1% of sales.

Applications on the system include accounting, cash receipts and accounts receivable, manufacturing production and inventory control, engineering, sales/marketing, forecasting, simulation and shipping. But according to Confer, "We've just scratched the surface of what Mapper can do ... Over the next five to six years, we plan to convert almost everything to Mapper."

Out in the plants, the system is used to check work-in-process orders, verify inventories, check materials on order, do references, master scheduling and check actual against standard costs. Inventory audit trails are created by Terry Louvin, production control manager, and customer service has been improved. "If I have a sales inquiry on the status of a shipment in production ... I hit the terminal and normally the screen will tell me everything I want to know," he said.

Smoothing the Work Flow

Mapper is also smoothing the work flow on the production line. "With over 2000 jobs in process, there is no way we could keep track of things manually," claimed Carroll Pruitt, shop superintendent.

"We used to operate out of our hip pockets, but now we know what we should be working on and when we should be working on it. And the information is available to a group of people, so we're not dependent on just one guy," the shop superintendent said.

When asked if there had been any complaints about the new system, Vice-President of Operations Bruce Shearer said, "None whatsoever — you can't find an unhappy user here."

John Confer (right), Woolley Tool and Manufacturing's DP manager, discusses data with Bruce L. Searer, vice-president of operations.

Improving Productivity Focus of October Cpeug Meet

WASHINGTON, D.C. — "Improving Organizational Productivity" is the theme of the 18th meeting of the Computer Performance Evaluation Users Group (Cpeug). The meeting will take place here from Oct. 25 to Oct. 28.

This event will focus on the expanding role of computer performance evaluation in federal DP facilities.

Exhibits, tutorials, case studies, panels and a technical program will comprise the agenda for this year's meeting, according to conference sponsors.

Registration for the four-day meeting costs $100.

Further details on the meeting are available from Cpeug at the National Bureau of Standards, Room A265, Technology Building, Washington, D.C. 20234.

Newsletter Offered On Video Training

SHREVE, Ohio — *Interactive Video Technology* is the title of a recently created newsletter published here by Heartland Communications.

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EASTERN

In-House Move Pays Benefits to Insurance Firm

By Terry Blankenship
Special to CW‡

BRENTWOOD, Tenn. — At State Volunteer Mutual Insurance Co. (SVMI), a physician-owned malpractice insurance company here, maximizing the return on DP dollars has always been a high priority.

The first and most obvious solution was SVMI's decision to leave the local service bureau where processing was handled and purchase its own computer, in this case a Hewlett-Packard Co. HP 3000 Series 30, to handle SVMI's needs internally.

Not only was the service bureau costly, it also proved to be very slow in responding to the company's needs. Furthermore, since there was no point-of-entry data editing, data integrity obstacles developed. Add to that the fact that it was not unusual for the service bureau's machine to emulate an elevator in its "up-and-down" state, and one can quickly see that SVMI was not being served well per dollar spent.

First Step

The first step in going "in-house" was to select the best consulting firm possible since SVMI had no DP staff. Keying on stability and competence, SVMI selected Arthur Andersen & Co. to develop an on-line policy and claims reporting system on its HP 3000 emphasizing real-time updating.

This was SVMI's first step in correcting its DP problem and proved to be an excellent investment. Arthur Andersen & Co.'s Nashville, Tenn., office handled the installation.

Not only did SVMI end up with a state-of-the-art insurance system, the company also established an "in-house" DP staff capable of defining and meeting future needs.

Therefore, four benefits surfaced with the purchase of an in-house HP 3000 and the resultant software development. These benefits include:

- SVMI's decision to handle its own DP needs vs. letting someone else do the job was cost-effective.
- The integrity of SVMI's data is much higher due to extensive on-line editing.
- The responsiveness to SVMI's information needs can now be measured in days, or sometimes hours, instead of weeks or months.
- The computer affects the cash flow of the company in a favorable way by automating policy renewals and installment billing.

Dollar for dollar, SVMI now gets many times the value from its DP-budgeted dollars with the in-house system vs. the service bureau. However, to accomplish this, SVMI had to decide whether to go in-house with its data processing and which consulting firm to use to develop its "start-up" software.

SVMI's criteria for selecting consultants included a proven track record, stability and a large enough company to respond to any problems that might arise. SVMI's consultants finished the project on time and on budget.

But even with that, much time and effort can be squandered on maintaining software for the computer. The company did not want to have a large maintenance staff of programmers putting Band-Aids on the system every day.

The solution? A genuine commitment to put more time up-front in analysis before coding begins so as to ensure a well-thought-out system.

Decreased Sunk Time

This, more than anything else, has directly contributed to a decrease in "sunk time" due to maintenance programming. Also, a set of understandable and common-sense programming standards enforced in the shop materially decreased subsequent maintenance programming time.

Any decrease in maintenance programming frees the staff for new tasks and new applications, thus getting more from their salary dollars.

In addition, system integrity is critical to a productive environment and to a company's ability to utilize the system. If a system is designed to integrate all the pieces of a whole, a much more cohesive, powerful and expandable system is available. Where system integration does not exist, duplicate file structures exist, and much time and money is spent on "tacking on" new applications.

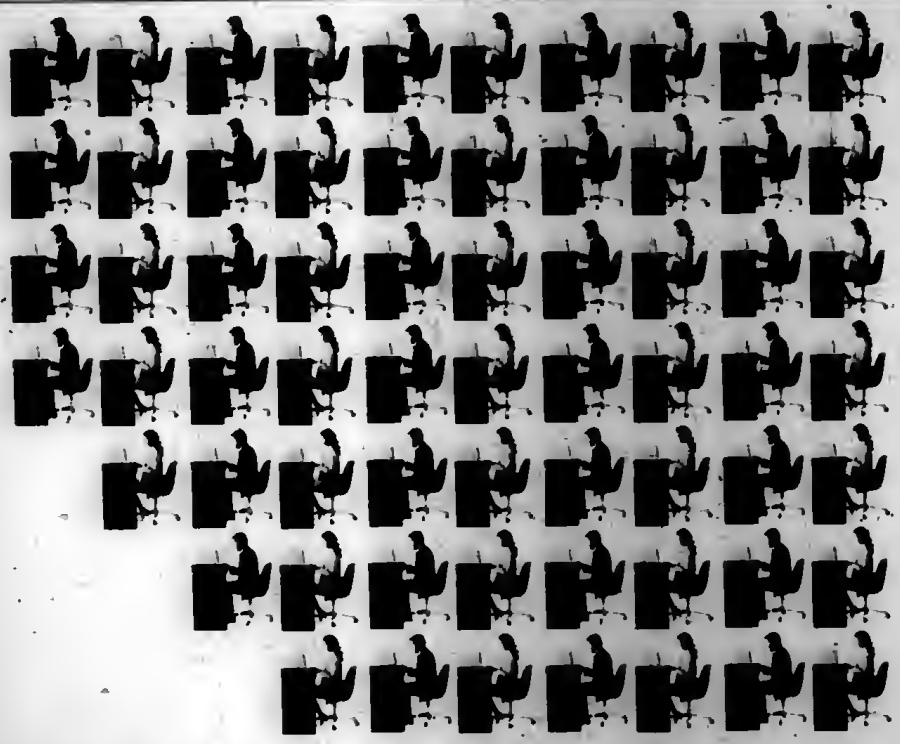
A well-thought-out data base can do much for accomplishing system integration, thus stretching the DP dollar even further.

Also, using a data base inquiry language like HP's Query language is a quick way to produce an almost infinite variety of reports with no programming time whatsoever. This also helps increase the productivity of DP staff.

Good management of DP personnel is an effective way to contribute to a powerful, yet tightly run DP shop. Imagine how many millions of dollars in salaries are wasted simply to cope with the high turnover in the industry. Why lose your good people? Why not seek to continually challenge them, to continually give them new responsibilities?

Good personnel ultimately make or break a DP installation. To get the most mileage from them, one must be willing to go the second mile with them.

Blankenship is DP manager at State Volunteer Mutual Insurance Co. in Brentwood, Tenn.



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ATLANTA — What do you do when you want an IBM environment but don't want IBM?

Alexander & Alexander Services, Inc. (A&A), the systems division of the insurance company of the same name, was faced with just that question about a year ago. The firm was using a Honeywell, Inc. 2060 processor, but expansion plans called for the development of a pension administration package, which would be marketed to other companies. Company brass felt the package could be marketed best to firms using IBM or compatible processors.

The firm's manager of technical support, Larry Leonard, recalled that the firm was interested in an IBM 4341 processor, but IBM could not deliver the hardware for eight months. As an alternative, Alexander & Alexander decided to look at the plug-compatible IBM market.

The firm chose an IPL Systems, Inc. 4443 processor with 4M bytes of main memory. The main reason the firm chose IPL, Leonard said, was because of the better delivery position. However, Adrian Paulet, vice-president of administration services, said that the firm also got a better deal from IPL.

In addition, the firm chose to install plug-compatible Control Data Corp. 33502 disk drives and Storage Technology Corp. tape drives, Leonard said.

"A&A has very substantial assets, but each division functions autonomously, especially in terms of budget. IPL saved us substantial dollars in terms of purchase price and operating costs over IBM," Paulet said.

Another problem A&A had with IBM was that the firm wanted to run an older version of the MVS operating system on the 4443. IBM would not support MVS unless it was the more recent MVS-Systems Products (MVS-SP) operating system. "At this point, IPL took full responsibility for bringing up [our system]," Leonard said.

Since then, A&A has developed Penad, a pension administration package, which it has marketed to several companies. Future plans call for the development of other pension-related packages.

"I've never regretted the decision to go with IPL. As things stand now, I have no reason to seek out any other vendor to satisfy future needs," Paulet said.

Fuji Offers Report Covering Fifth Generation

TOKYO — Fuji Corp. is offering English translations of the "Computer White Paper," a publication of the Japan Information Processing Development Center (Jipdec) outlining progress toward development of fifth-generation processors.

The report, which costs $45, says fifth-generation processors will be in wide use by the 1990s. According to the report, the processors will have very high-level problem-solving capabilities and will be able to comprehend problem descriptions and requirement specifications, synthesize processing procedures, optimize between machine systems and processing procedures, synthesize responses based on output from machine systems and offer an intelligent interface function capable of understanding speech, images and natural language.

The report is available through Strategic, Inc., Suite 215, 4320 Stevens Creek Blvd., San Jose, Calif. 95129.

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Deadline for submitting abstracts is Sept. 15. More information is available from J. Philip Miller, Division of Biostatistics, Washington University School of Medicine, Box 8067, 4566 Scott Ave., St. Louis, Mo., 63110 or from SAS Institute, Inc., Box 8000, Cary, N.C. 27511.

FOURTEENTH ANNUAL PITTSBURGH CONFERENCE ON MODELING AND SIMULATION '83, Pittsburgh, Pa., April 21-23

The School of Engineering of the University of Pittsburgh, the conference sponsor, is seeking papers for presentation. Special emphasis for the conference will be on microprocessors and their applications as well as energy, social, economic and global modeling and simulation and papers on all traditional areas of modeling and simulation.

Only papers that have not been published previously will be considered.

Two copies of titles, authors, all author's addresses, abstracts and summaries should be submitted by Jan. 31. The abstract should be approximately 50 words in length and the summary should be of sufficient length and detail to permit careful evaluation.

All correspondence should be directed to William G. Vogt or Martin H. Micle, Modeling and Simulation Conference, 348 Benedum Engineering Hall, University of Pittsburgh, Pittsburgh, Pa. 15261.

Textile Division Spins Savings With System

Special to CW

CINCINNATI — Stearns & Foster Co. is saving $20,000 monthly in inventory adjustments and has reduced inventories by 10% since it implemented a production and inventory control system.

The firm's Textile Division was the first to install IBM's Communications Oriented Production and Inventory Control System (Copics).

First on the agenda was a detailed analysis of the division's records and procedures, an important step because of the large number of materials and functions involved in the manufacturing processes.

With this information in hand, Stearns & Foster installed four Copics modules: inventory accounting; bill of material for engineering and production data control; product cost calculations for cost planning and control; and advanced function material requirements planning to provide for the budgeting of material acquisition. The Copics programs run on a 4331 Model Group I processor with DOS/VS and CICS.

Copics produces and maintains accurate inventory counts of raw material, in-process and finished goods; contains and maintains all standard costs; and includes and maintains bills of material.

The committee that had been formed to oversee the project realized that the success of any new plan would depend upon the cooperation and understanding between management, data processing and end users.

Chief Reason

One of the chief reasons for the company's success with the system, according to committee member Charles J. Browning, was the decision to make Copics the users' program and responsibility.

Browning said that "Employees are enthusiastic about the system because they are using current, accurate information and many of them contributed to its design and implementation. We emphasized that Copics was their system and it would only be as good as they made it."

Paul Sundquist, who served as the "working manager" of the project, echoed Browning's comments. "Copics is working because the users themselves wanted better information. With Copics, they can check more often and more thoroughly on the accuracy of that information.

"Because we can make corrections in 30 seconds, we don't build one error into a series of errors," he said, adding, "Copics is so flexible that corrections can be made immediately without even interrupting the normal flow of required information."

Copics was a catalyst in centralizing the company's data base. Information on pricing, sales, distribution, engineering and production is fed into the same system.

The company has thereby gained accurate control over the location of inventory which, in turn, has led to better cost control. Inventory levels have been reduced, providing savings in waste and shrinkage.

"Fibers have been reduced from a three- to four-month level to one month — a reduction of over 39% — and inventory investment has been reduced by 10%, which saves $15,000 per year in carrying costs," Browning said.

Manufacturing operations in the Textile Division begin with various baled fibers that are processed, combined with specific chemical formulations and finally converted into finished industrial and consumer products. Accurate information must be kept on formula changes as well as engineering and production changes.

Copics provides that information together with similar information for nonfiber raw materials such as chemicals and packaging materials. As these materials proceed through the manufacturing process, the system tracks quantities, locations, current costs and anticipated changes.

Fifteen remote terminals, serving 20 to 25 users, feed information to the data center. Training users on the remote terminals was a simple process, Browning observed, and has increased employee awareness of "what's happening and when."

Additional Benefits

Charles Mason, shipping and receiving manager, cited additional benefits in inventory control. Besides actual reduction in volume of materials and square footage of warehouse space, less money is invested in dormant materials, and there is less damage and obsolescence.

For example, 28,000 square feet adequately stores nonfiber raw material. Prior to Copics, this material occupied 42,800 square feet.

Since the system provides for inventory identification by location, "first-in, first-out" turnover provides tighter controls over chemicals that might otherwise be rendered unusable over a period of time.

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CCP ANNUAL EXAMINATION

The annual examination for the Certificate in Computer Programming (CCP) will be held on December 11, 1982, at selected test centers throughout the world.

Specific requirements for this year's examination are detailed in the "Certificate in Computer Programming Examination Announcement and Study Guide." The study guide and application form for the 1982 examination are available on request from ICCP.

October 15, 1982

Please forward the "Certificate in Computer Programming Examination Announcement and Study Guide," along with application and test site list.

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Uses Fault-Tolerant Network

Bank Automates, Trims Teller Transaction Time

ST. LOUIS — Events in the banking industry are measured in minutes and seconds rather than in hours. Unnecessary delays can result in dollars lost and customers searching for another bank.

At Centerre Bancorporation here, formerly called the First National Bank in St. Louis, tellers must handle upward of 35,000 transactions each day. However, the bank has managed to keep up with this demand and still cut its teller staff by 10%. It does this by using a transaction processing computer that has cut processing time from 42 to eight seconds, according to William Travis, the bank's vice-president of retail banking.

With $3.2 billion in assets, Centerre is the 44th largest bank in the U.S. and has 22 branch affiliates scattered throughout the state. The bank has been growing at about 14% per year and is already ranked as Missouri'e largest. Besides retail customers, it elso provides services for 100 companies, Travis noted.

Prior to acquiring e Tandem Computers, inc. Nonstop computer system in early 1980, teller operatians were manual, except for savings, which were processed on IBM 1060 terminals. If a customer wented to perform a transaction or wanted an account's balance, it sometimes tied up that teller for five or 10 minutes for e search through e paper file. Now, with the Tandem system, balances can be given to customers immediately, Travis stated.

System Failures Minimized

The on-line terminal teller network consists of 160 Incoterm Corp. Series 7500 teller stations and 29 Diebold, Inc. automated teller machines (ATM) connected to a six-processor Nonstop system. Roughly 90% of the bank's business is handled by the tellers and 10% by the ATMs. System failures are reportedly minimized by the computer's design.

"It's a fault-tolerant system, made to continue running if any component should fail," Travis said. "It can even be repaired on-line without interrupting operations or endangering data."

Feult tolerance was the reason Centerre chose Tandem over competing machines, the bank's vice-president observed. If an entire processor fails, the system reportedly is built to carry nearly the entire transaction load without an eppreciable loss in transaction time.

The system not only juggles transactions, but is used to prepare four reports: e daily teller report listing every transaction and all totals, en ATM analysis report that provides the same information for ATM transactions, a network analysis report summarizing activities on the entire network every half hour to ascertain peak loads and a monthly report used to evaluate teller productivity.

While the Tandem system does perform audit duties, receiving data from the teller stations, an IBM 3033 mainframe is used to batch process data that is later extracted from the on-line system to tape, Travis pointed out. The IBM creates transactions, edits them and then warehouses the valid transactions until the epplications are processed. Each transaction is also automatically processed by the Nonstop system, which updates the eppropriate files, adjusting balances and status codes.

Thus far, the bank's Tandem system has survived initial user resistance and e six-block move to a new building, which ocurred earlier this year.

"Because half of the teller staff used manual procedures for three to 30 years, there was some resistance to the computerization," Travis noted. "Concerns they expressed were how to post corrections if an error is made in processing, where to look first if en out-of-balance condition occurs, what resources to use if the system goes down and [what] impact 'paperless' transactions have on a customer eccount."

Travis meintains that attitudes changed from skepticism to enthusiasm once the procedures were firmly set in place.

The move to the bank's new 30-story headquarters in downtown St. Louis was equally nonconsequential, resulting in only minimal computer downtime, Travis claimed.

DP Directory Lists CCP, CDP Holders

CHICAGO — A directory listing all holdera of the Certificate in Computer Programming (CCP) and Certificate In Data Processing (CDP) worldwide is available from the Institute for Certification of Computer Professionals (ICCP).

The directory, which has some 23,000 entries, identifies each holder alphabetically as well as the type of certification earned. Addresses are included. The directory is also catalogued by state or province and by country.

The directory costs $7.50 plus 86 cents for book-rate postaga. It can be ordered from the ICCP, 35 E. Wacker Drive, Chicago, Ill. 60601.

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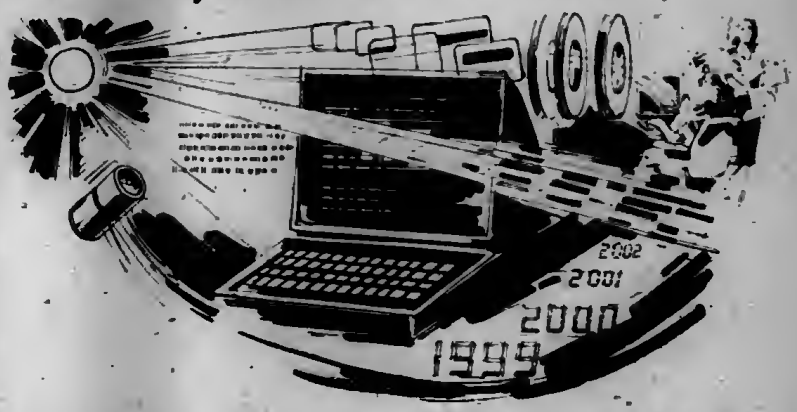

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TEST AND INTEGRATION ANALYST
Background in software and systems testing methodology for large-scale systems required Prefer 4 years on-line programming experienca

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Firm Hikes Productivity With On-Line Reports

FORT WORTH, Texas — Increased programmer productivity and reporting flexibility have arrived at Champlin Petroleum Co. ever since the firm replaced its manual report system with an on-line reporting system.

Champlin, a subsidiary of Union Pacific Corp., is engaged in exploration, production, refining and marketing of oil and gas products. Production activities are monitored through a system of reporting that involves a network of 12 region/district offices located west of the Mississippi and as far north as Calgary, Alberta, Canada.

Four years ago, the reports — which compile information on the activities of producing properties — were prepared manually by clerks at each district office and submitted to company headquarters for processing into specific formats through keypunching and feeding into a card-based computer system.

Lack of Flexibility

When Don Erwin joined the firm back in those days to head up the in-house report system, he saw the lack of flexibility inherent in the existing method and set out to redesign it. "Our original plan called for a terminal-oriented system that would allow us to capture basic data — data that was fundamental to the system — only once, and capture it at the source," Erwin recalled.

"If the data originated at a district office, we wanted them to be responsible for inputting it," he said. "We had to have a system that could accommodate the need for each office to see its data differently, and we wanted to avoid taking a lot of design time trying to anticipate every office's different and unique needs."

In short, he said, "We wanted to spend our programming dollar [not only] on making sure that we provided good mechanisms for capturing the data, but also to provide end users with the facility to create their own reports."

In 1980, Erwin contacted Informatics General Corp. about the availability of a system to streamline the reporting function. Erwin was familiar with Informatics because its Mark IV implementation system was used in Champlin's Information Services Department.

Non-DPers Considered

Mark IV is used for batch application implementation, data management and information processing, but Erwin was concerned that Mark IV alone was too sophisticated for non-DP personnel to understand. Champlin needed a system that would give them Mark IV-type capabilities and that could be operated by their non-DP end users at the district offices.

"The day we had the meeting with Informatics, we laid out our plans and apparently Answer/DB had just been announced," Erwin said. "We took one look at it and said that's exactly what we want."

Answer/DB is an on-line report writer with an interactive syntax checking and editing capability, which runs in conjunction with Mark IV. For installation at Champlin, modifications were made to the package allowing it to tie in with Champlin's new menu processing system and to accommodate other requirements.

At Champlin, Answer/DB runs on an IBM 3033. There are from two to six IBM 3270 terminals at each office, and in several locations, IBM 3776 and 3777 printers are used.

The reporting system is used at Champlin to produce most of the ad hoc user reports that had caused DP backlogs. Users can create their own report requests at their convenience from terminals in their own departments.

Requests for reports that will be needed more than once can be stored and resubmitted when needed, and the information is easily modified if necessary, Erwin explained.

How flexible is the system? Erwin cited the case of a manager who asked to see net sales every month for his district — a report not previously available. "Using Cobol would have required several days of programmer time, but with Answer/DB programmers didn't have to get involved in writing a program to create the report," Erwin said.

"With Answer/DB, programming took 15 minutes," he said. "From a productivity standpoint our programmers are now free to do the things that relate to the integrity of the data. Answer/DB has paid for itself already with the savings in programmer time."

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Users Help Private School 'Go Distributed'

HONOLULU — With most private schools feeling the pinch of rising costs and a scarcity of outside revenue, an efficient data processing operation is critical, but must be used in such a way that users are not threatened by the system's technology.

That was the approach Richard Turk, director of the DP department for the Kamehameha Schools and the B.P. Bishop Estate here, took in changing the organization's DP structure from a centralized, batch operation to a distributed, interactive environment.

Four of the 11 people on the DP staff are programmers. With the exception of the NCR Scholar and the Topps software packages (Topps was acquired from the Toledo Hospital), the DP department has developed its own applications.

Few private educational institutions have as solid an economic base as the Kamehameha Schools. The schools were organized to provide quality education for Hawaiians as a provision in the will of B.P. Bishop. Her estate leases nearly 25,000 properties in Hawaii and has developed and manages the Royal Hawaiian Shopping Center in Waikiki Beach.

Turk believed that in order for people to overcome their fears and resistance to automation, they have to be involved in long- and short-term planning for new applications.

"I believe in distributed data processing and/or in networking because of the human factors involved, as well as the benefits these methods provide," Turk said. "It is the surest way of getting people quickly involved with using the DP tools we can provide."

Turk, who was formerly a Los Angeles-based auditor with one of the "Big Eight" accounting firms, took the private school job with the goal of restructuring the DP environment to meet today's technology.

During his tenure, the DP department has upgraded from a 64K byte NCR Corp. Century 101 system to an interactive NCR V-8455 with 1M byte of main memory and up to 800M bytes of storage. "We made a smooth transition, adding interactive terminals as new programs were brought on-line and later installing NCR's Virtual Resource Executive operating system as a multiprocessing tool."

Currently, the system permits a 20-terminal network, but can be expanded to allow up to 256 terminals by investing $40,000 in a multiplexer.

The DP department, once located at the schools, now has its own quarters. Formerly, half the capacity was used for educational applications and half to serve administrative purposes. The mainframe system now supports only the administrative services, while a minicomputer and 20 terminals were installed at the school to provide students access to a system for educational purposes.

Despite the upgrades and changes in the DP operation, Turk was pleased he has not had to increase his DP staff. The operation has 11 staff members, four of whom are programmers, who have developed most of the 485 applications now in use.

Users Committee

Turk has established a users committee with representatives from all the organization's main business units. The committee, which Turk sits on, sets all the objectives for DP and negotiates priorities.

So far, the DP department has developed most of its own programs. "We are sitting here on a flowerpot located some 2,500 miles from the nearest big city. We have to give a lot of thought to the cost of installing and maintaining someone else's software as well as buying it," Turk said.

However, there are exceptions. Turk's DP operation recently adapted the interactive payroll and personnel package, called Topps, developed by the Toledo (Ohio) Hospital. Prior to acquiring Topps, Turk evaluated about 15 software suppliers.

In addition, the Kamehameha Schools and B.P. Bishop Estate also acquired the NCR Scholars package and adapted it to provide maintenance of students' academic histories, daily late and absent files, class scheduling, grading and property management.

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Texas State Agencies Pool DP Resources, Cut Costs

AUSTIN, Texas — Government agencies are not the usual breeding ground for innovative business practices that increase productivity and reduce costs. But in the last decade, two Texas state agencies have proven to be just that.

The Texas College Coordinating Board and the Texas Industrial Accident Board — very different in function but both burdened with massive loads of paperwork — have pooled their DP resources for greater efficiency at lower cost to taxpayers.

The Coordinating Board maintains detailed up-to-date records and issues periodic reports on the state's 100 public colleges and universities; it also administers student financial aid programs. The Industrial Accident Board processes about 175,000 compensation claims a year and maintains records oo Texas employers, who paid out more than $1.3 billion in 1980 for workmen's compensation insurance coverage on their 5 million employees.

In 1971, the two agencies merged their DP operations into one computer system. In 1976, the system was expanded with the purchase of a Honeywell, Inc. Series 60 Model 66/10 large-scale computer, which has since been upgraded to a 66/40. In the past year the system has also provided support for the semipublic, nonprofit Texas Educational Foundation.

Roy James (left) confers with Bill Treacy on the Honeywell, Inc. Model 66/40, which is shared by their two agencies.

The merger has reportedly resulted in a dramatic increase in DP capability for both state agencies and a more cost-effective utilization of the computer hardware purchased with state tax dollars.

"The arrangement has worked very well, partly because the needs of the two agencies are very well balanced," reported Roy James, DP director for the Coordinating Board. "We generally use different parts of the main computer and different hardware to perform our respective jobs.

"The Industrial Accident Board updates its files through terminals," he explained, "while the Coordinating Board does batch jobs. Each of us has more processing capability than we would have standing alone, and we are making use of what otherwise would be slack time on the computer."

Credit for the arrangement goes to Bill Treacy, executive director of the Industrial Accident Board, who approached James in 1971 with the idea of sharing a computer: "We need computing capability in the teleprocessor mode, while the Coordinating Board needs the slack in its system to be taken up," Treacy explained.

Under the agreement, the Coordinating Board provides 34 DP employees while the Industrial Accident Board has only four. "While we have saved well over $1 million by avoiding duplication of hardware and software, this represents less than half the cost of operating a computer system," James said. "We are saving much more than that by avoiding the duplication of a site, facility, people, utilities and security."

Increased DP Needs

The DP needs of both agencies have increased steadily over the past decade, due largely to the fact that Texas, unlike other states, is growing in both population and college enrollments.

The Coordinating Board's computerized loan collection system keeps track of loan payments and automatically prints notices on delinquent accounts. The system is tied in with local credit bureaus throughout the state, plus other computers in the state comptroller's office.

"When I first came here in 1969, we had 50,000 loans and legislative authority to loan up to $285 million, with no collection system," James said. "Today, we have more than 642,000 loans representing more than $236 million, and we operate our own fully automated collection system."

ANNOUNCING: IN-DEPTH SEMINARS IN ADVANCED COMMUNICATIONS
September 15, 1982, Boston

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A full day of professional instruction by industry leaders will be held on September 15, 1982, as part of The OA Forum at the Marriott Long Wharf Hotel, Boston.

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Teleconferencing: Low-Cost Systems for High-Payoff Applications
Dr. Dinos R. Doll, President of The DMW Group
John W. King, Vice-President of The DMW Group

Dr. Doll and Mr. King will take a pragmatic view of the equipment and services available for TC, including freeze-frame video and datacom-based compression techniques. Material will be drawn from a recently completed TC study for a large multilocation user, and demonstrations will allow hands-on experience with leading vendor equipment, and a field trip to a user site.

Dr. Doll is a recognized expert in design, planning and implementation of advanced communication systems and computer networks. Mr. King is responsible for DMW activities in the Western U.S. and coordinates strategic planning projects for clients in the U.S. and Europe.

Strategy and Planning for Selection of Computer Branch Exchange Systems
James A. Doherty, Senior Vice President, Voice Communications, The DMW Group, and **Dr. Doll.**

This session will cover: **Developing the Request For Proposal (RFP), Local Area Networks Interfaces/Gateways, and Implementation and Cutover Planning Considerations.** Mr. Doherty will detail new methodology required to design cost-effective systems. Those presently utilizing individual switch configurations, tandem networks, and users considering staying with the Bell system or moving to independent vendors, will find the material current and comprehensive.

Mr. Doherty's background of over 30 years in telecommunications includes key roles with Pan Am and Collins Radio, as well as with Equitable Life where he was responsible for the selection and implementation of the largest private interconnect system installed to date — the Danray CMX 8000.

Selecting and Implementing Electronic Mail Systems
Thomas A. Hannagan, President of Hannagan & Associates

The session will define the basic elements of an electronic mail system and discuss the advantages and disadvantages of various products. Key topics include: evaluating and choosing a system; selling and justifying it to management; planning a pilot project; and implementing a full-scale system.

Mr. Hannagan, as Vice President and Manager of Office Automation for Continental Bank, Chicago, directed the planning and implementing of executive support systems including electronic mail, word processing, voice messaging and executive information access tools used to create paperless offices in an integrated fashion for over 1,500 executives.

Formulating An Office Automation Strategy and Plan
Dr. Michael Hammer, Founder of Hammer & Co. and Associate Professor at MIT

Dr. Hammer will examine the need for an organized approach to office automation planning. Topics will include: objectives, strategy and planning; pilot projects; analysis, design and illustration; strategic alternatives and impact; workshop and discussion of attendee problems and interests.

An advisor to major firms on strategic implications of OA including the development of office systems products and marketing strategies, Dr. Hammer also leads a major research program at MIT and is now engaged in the design of a multifunctional office workstation.

The OA Forum, September 13-15, 1982, is a comprehensive three-day program designed to examine new concepts and technologies crucial to the automated, integrated office. It will address three major topic areas with specific interest to the Data Processing/MIS professional.

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Attend the day of your choice, any two, or all three days.

Registration for the full-day, In-Depth seminar alone is $295. (A reduced rate is available to those attending other days of The OA Forum.) Sessions include notes, lunch, coffee breaks and reception for interfacing with instructors. Full course outline is available on request. Costs for Personal Computer Day (Sept. 13) $145; DP's Role in Office Automation (Sept. 14) $245. A special three-day combo registration is only $595 which includes lunch daily.

To register, or for more information, call Louise Myerow, Registration Manager, **toll free 1-800-225-4698** (in Mass. call collect 617-879-0700).

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Oct. 2-3, New York — **CICS Command Level Intensive Course.** Contact: Sys-Ed, One Park Ave., New York, N.Y. 10016.

Oct. 3-6, Salt Lake City, Utah — **Health-Oriented Electronic Computing.** Contact: Larry Grandia, Director of Management Systems, Intermountain Health Care, Inc., 36 S. State St., Salt Lake City, Utah 84111.

Oct. 4, Palo Alto, Calif. — **The 15th Annual Workshop on Microprogramming.** Contact: Dr. Joseph Fisher, Microprogramming Workshop, Yale University, Box 2158 Yale Station, New Haven, Conn. 06520.

Oct. 4, Atlanta — **The James Martin Executive DP Seminar.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

Oct. 4-5, New York — **Local Area Networks.** Contact: Ungermann-Bass, Inc., 2560 Mission College Blvd., Santa Clara, Calif. 95050.

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(Continued on Page 34)

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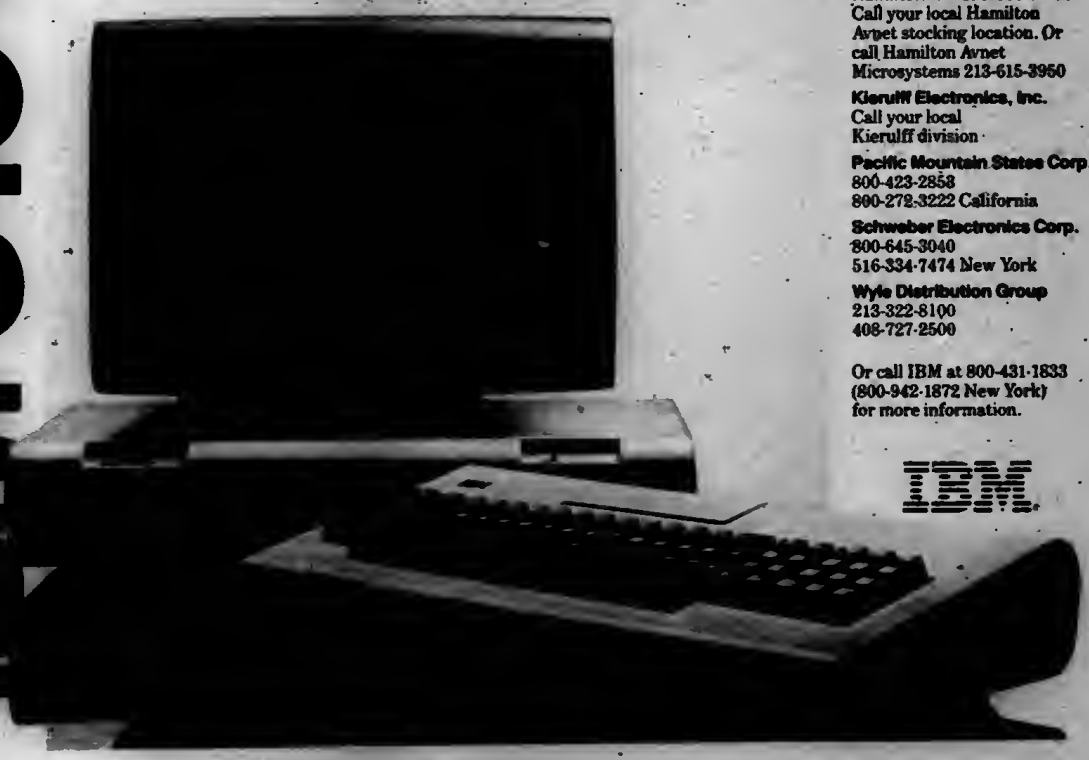

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(Continued from Page 33)

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Managing the Data Center As a Business

By Allan F. Froehlich

The data center should be run like a business — by balancing people, hardware and software resources. The first half of this article shows the difference between managing and merely operating and provides a model for a well-balanced data center. The second half gives strong arguments for running your data center as a business.

Operating a data center without managing its resources means making "seat-of-the-pants" decisions and reacting to events rather than planning for them. Figure 1 (on Page 37) illustrates this "primitive" organizational structure in a simple diagram. Here, the data center users are seen as the source of existing applications, and these applications make up the work profile of the data center. The data center manager's (DCM) job, then, consists of ensuring that the applications are processed and the results sent back to the users. From this point of view, the data center is part of a single processing loop, interfacing only with data center users.

Figure 2 shows the perspective of data center managers who view their jobs as managing strictly the computer hardware. These managers let the resource availability determine priorities for the work load, and they use the production results to review hardware utilization. In other words, all their focus is on the effective use of the hardware itself, which is why we label this the "unbalanced" data center.

Hardware is only one part of a rather complex set of resources the DCM must manage. In fact the DCM needs not only to use these resources effectively but also to maintain contacts or links with the rest of the organization. These links include the manager's routine dealings with users, with the systems analysts and programmers and with the organization's top management. Figure 3 depicts these relationships and shows the basic elements of a well-balanced data center.

The service agreements, work profile, management policy and data on resource availability form input to the data center;

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IN DEPTH

the performance review, production results and resource utilization review form the center's output. Now the data center is part of two control loops — the *operating loop* on the left side of the diagram and the *planning loop* on the right side.

Both users and data center personnel participate in the operating-loop activities. When an application becomes part of the data center work load (the work profile), a service agreement is negotiated between the user and the center. The agreement indicates the expected volume of work for the application (that is, the number of transactions to be processed each week or the hours of operation for an on-line system) and the expected performance levels (such as the delivery time for batch reports or the availability of the on-line system).

User managers and the DCM must review the operating results from the data center on a regular basis, comparing the results with the service agreement targets and noting any significant changes in the volume of existing applications or any performance areas that could be improved.

The planning loop involves users, organization management, systems analysts and programmers (that is, those involved with application development) and data center personnel. Given the existing service agreements from the operating loop and the expected work-load levels from new applications, the DCM must review the use of the data center's total resources (people, hardware and software) in order to anticipate future resource needs and must convey these needs to management.

When current resources appear inconsistent with anticipated needs, management policy is needed to authorize significant changes in the resource mix or to consent to adjustments in the center's service levels. For example, staffing may be inadequate for the installation's planned work load, in which case upper management may authorize the hiring of additional or specialized staff.

Or, if the DCM anticipates a dramatic increase in the number of on-line terminals, the resource utilization review may indicate that the existing hardware or software resources are insufficient for this expected growth. In that case, corporate management may approve adding computer capacity or may direct users to live with extended response times at the terminals instead of installing additional hardware or software. These examples illustrate the links that the data center manager must maintain among data center staff and resources, new and existing applications and the organization's management.

DCM's Job

Your job as data center manager is to manage the activities and maintain the relationships involved in both the operating and planning loops. When the two loops mesh smoothly, the users are active and enlightened participants in the center's activities, the data center is responsive to the users' needs, the total computer resource is put to good use and management makes *policy* decisions (not technical decisions) about the level of resources available for serving the users.

There are certainly differences of scale among small, medium and large data centers, but all of the essential functions of the center and its manager are the same. The functions carried out by data center staff specialists in the large center are handled on an informal basis in the small center.

Perhaps without realizing it, the DCM in a small center has service agreements (usually in the form of verbal commitments to users), performance reviews (frequently through face-to-face contact with user managers), a work profile (often in the heads of a few people who know all the applications in the center) and is acutely aware of the use and availability of resources (since the DCM in a small center often gets directly involved in setting up, scheduling and perhaps running jobs).

The material in this article is focused on the medium- and large-scale data center, where more formal methods are needed and used, but the ideas apply to smaller scale in-

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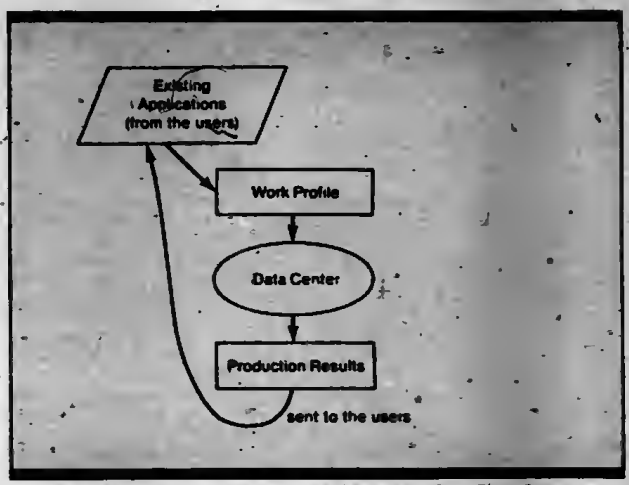

Figure 1. Primitive Organizational Structure for a Data Center

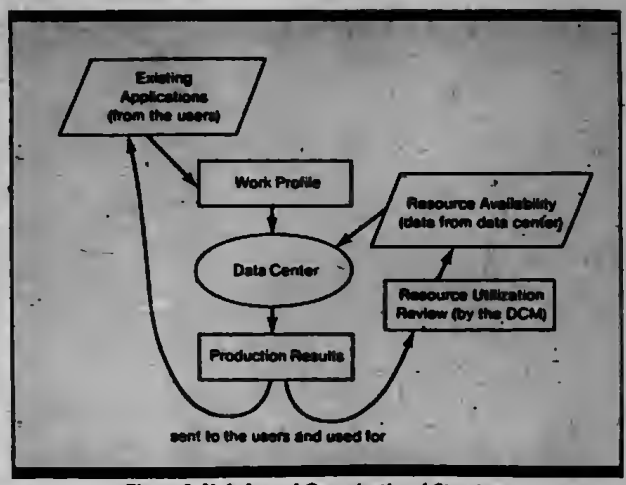

Figure 2. Unbalanced Organizational Structure

stallations, too. As the small installation matures and its work load increases, more formal, disciplined approaches are needed in managing the center, approaches that are described in this article.

At whatever scale the data center exists, the DCM must have expertise in a number of disciplines. The operating loop involves the skills of a production control manager (one who is able to respond quickly to changes in the operating environment), the talents of an expert in customer service and public relations (one who is ready to deal with possibly conflicting demands from several quarters) and the abilities of a cost-conscious entrepreneur (who can eliminate wastefulness whenever possible).

The planning loop calls into play the skills of an industrial engineer (in trying to squeeze every possible drop of efficient production from the given resources), the foresight of a long-range planner (in attempting to anticipate future resource needs) and the perspective of a general manager (in persuading top management of the level of resources necessary to meet present and contemplated service and cost objectives). *All of these roles require a continual examination of the resource/service mix by the DCM.*

Added Complications

While computer technology continually changes and influences the center from outside the organization, the needs and maturity of the center itself change; the fact that these changes occur at different rates adds another complicating factor to the DCM's job.

For those installations that have a highly integrated data resource (such as the communications networks and data base applications typically found in medium- and large-scale centers), the basic functions shown in Figure 3 apply, but additional functions must be evaluated and divested or absorbed from time to time. For example, where should the reporting responsibility be for such functions as word processing, communications control and data base administration?

Wherever management eventually assigns the responsibility, you (the DCM) must adjust to the situation. If a function such as word processing is assigned to the data center, you must take this resource into account in terms of user or customer service (operating loop) and resource utilization (planning loop). If the functions are assigned outside the center, you must provide links (such as data transfer and file interface) to those functions in order to maintain the desired service levels for the organization.

Applying This Information

The following questions may help you examine your own data center:

1. If you were to diagram the organizational structure of your data center, would it resemble the balanced picture shown in Figure 3?

Hint: If yours is a balanced center, you should be able to identify representative activities for each part of the diagram. Review the data center diagram regularly and list the areas where you feel the center is out of balance. (For instance, you may not receive information early enough on planned applications, or you may feel that user participation in performance reviews is unsatisfactory.) These items then become an agenda that points out what actions to take in order to achieve a balance and that helps you evaluate progress over the next few months.

2. Do users regularly participate in the operating loop in your data center?

Hint: To measure the level of user participation, ask yourself how often you meet with users to review service agreements and data center performance.

3. Does top management understand its role in the planning loop?

Hint: To ensure that your answer to this question is yes, you can use the following recommendations:

- Keep management informed by periodically presenting information about resource utilization and availability.
- Give management an idea of where you expect the data center to be in the next two to three years and what type of management support you need to realize these goals.

In summary, to achieve and operate a "well-balanced" data center, you should do the following:

- Understand what is going on in the data center among hardware, software and people. Be able to explain underutilization of any of these resources, excessive overtime or dramatic peaks and valleys in the work load.
- Establish and meet the service goals that should be reflected in written service agreements with users.
- Develop a data center forward plan and relay this plan to upper management. The plan should indicate the expected work loads and service levels and the resources that will be needed.

2. As Business Operation

Although the cost of hardware on a per-unit basis is declining, total data processing costs continue to increase dramatically. From 1970 to 1978, aggregate U.S. data processing budgets rose almost 2½ times from a total of $17 billion in 1970 to $42 billion in

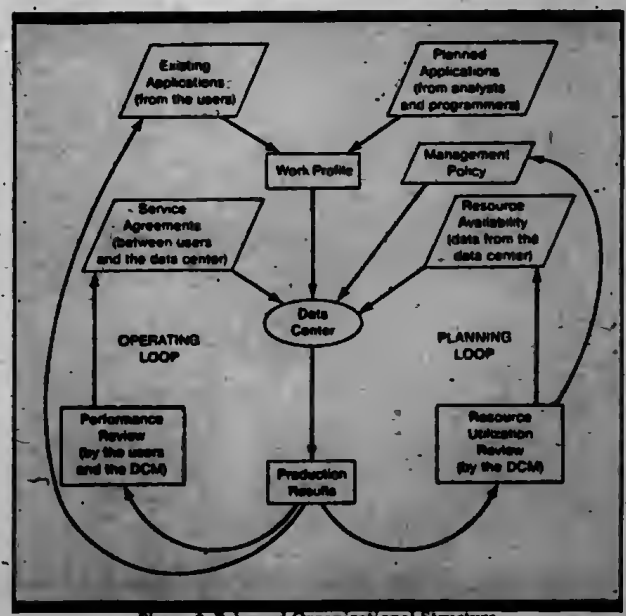

Figure 3. Balanced Organizational Structure

IN DEPTH

1978. This trend is expected to continue in the '80s. Aggregate spending for data processing is expected to top $78 billion in 1983 — almost double the amount spent in 1978 (International Data Corp., 1980). As more corporate applications are put on the computer, the DCM is managing a larger budget and the data center is becoming a very visible, integrated part of corporate operations.

To control costs, you should review them periodically "from the ground up." Don't simply extrapolate past costs.

Rising costs and increasing visibility are not problems the DCM can solve on technical expertise alone; they are typical of any growing business.

Changing Technology

Barry W. Boehm has noted that the degree of freedom in software engineering design has changed dramatically from the '50s to the '70s and that this trend will continue in this decade [*Research Directions in Software Technology*, MIT Press, 1979]. For example, Boehm has pointed out that in 1950, only about five choices of CPU equipment existed. In 1970, about 200 CPU choices existed; of these, 100 were among the likely choices. There were no data management systems available in 1950, but by 1970 there were 100 possibilities, with about 30 of these being the likely choices.

Along with this proliferation of hardware designs, price-vs.-performance characteristics continue to change. For example, the IBM 370/138 had an attractive cost of $1,217,000 for a million-instruction-per-second (Mips) performance compared with the older 370/158, which cost $1,658,000 per Mips (*Computer Economics Report*, 1982). Also, vendors regularly announce new capabilities or additional features for existing equipment components. The way in which the components are attached or connected to each other is frequently modified, enhanced or restricted.

All of these changing factors make the DCM's task somewhat akin to trying to draw pictures in a surf-washed sand. Each time one looks around, the picture has changed or been washed away. No matter what combination of hardware and software one chooses, that choice can appear flawed when the next vendor announcement appears (usually, it seems, within days or weeks of one's most recent major configuration decision).

You should test such an announcement against your corporate data center plan and identify the total impact of the changing technology (that is, the changes needed in staffing, training, software and procedures, and the cost/benefit relationships of these changes). In other words, you must use good business sense to determine, if each change affects the corporation, if the change should be assimilated into the data center and how the change should be assimilated so that it either improves service or reduces costs.

Qualified People

Qualified data processing personnel are in short supply; consequently, the DCM

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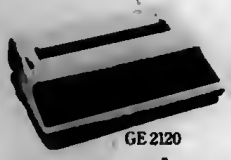

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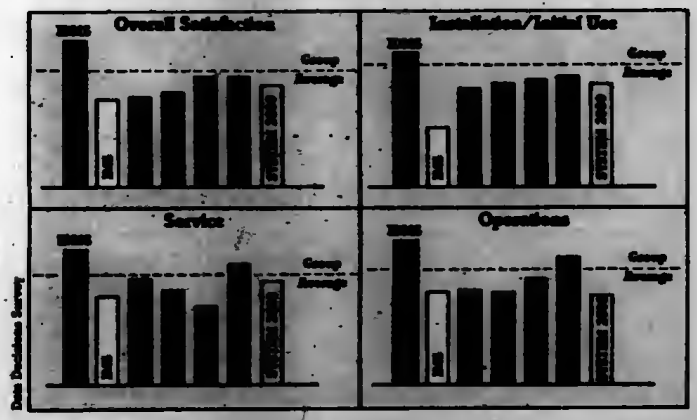

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is competing for personnel in a seller's market. However, people enjoy being part of a well-run organization; they enjoy being part of a winning team. To help make your people feel that they are winners, hold brief but regular meetings with staff members and point out how their work has helped the company make more money. Mention cost-saving ideas that have been suggested by users and by the data center staff.

The DCM who can manage the total computer resource to produce a winning combination will find it easier to attract good people to the operation. Specifically, a data center with good operating procedures, one that has a high on-time performance record and a reputation for reliability with its users, and one that makes good, cost-effective use of its people and equipment will tend to draw better people to the company than a data center that is poorly run. These same characteristics will help the well-managed data center keep the good people it already has.

Demand for Services

In spite of occasional flurries of resistance to a computerized application of to computers in general, users most often come to accept the use of a computer in their daily business lives. In fact, not only do they accept it, but after an application has been in production for a time, users will actually resist the removal of the automated application and will usually ask for the automation of additional applications.

As the number of applications increases, the computer becomes a very visible part of the user's operation. Consequently, user department managers become more aware of what a computer can do for their departments and of the generally falling prices of hardware. This combination of a desire for more applications, an increased awareness of the potential of the computer and more attractive pricing for computer equipment leads to a greater demand for computer services.

You should stay in close touch with your users so that you can anticipate increased demand and respond creatively while holding costs down. For instance, explore ways of documenting job setup procedures so this task can be done by the user. This puts more control in the user's hands, reduces the data center work load and frees up data center resources.

Competing With DP Alternatives

Finally, the data center should be run on a cost-effective basis because of the presence of competitive alternatives. If you do not do an effective job of managing the data center, someone else will. The DCM's goal is to "stay in business," and this applies both to the data center and to himself. To put it another way, by providing the best service possible (service whose costs the users can justify readily because of the benefits), the DCM will have a facility that is more economically attractive than the facilities and services available from others.

Viable methods of processing data now include time-sharing, facilities management, contract programming, packaged programs and the like. Vendors selling these alternatives routinely make their pitch to top management and to the users. For this reason, the DCM must be continually aware of what a given service costs the organization and of what that service would cost from others.

With the wide array of equipment and software available, the DCM should be prepared to help users evaluate alternatives and to counsel users as to the most cost-effective way of doing the job. In addition, you should seek out friendly users who will "pilot" new technology on a limited scale before it is introduced to broader areas of the company.

Entrepreneurial Personality

These aspects of the DCM's job may lead you to ask, "Who in his right mind would want to manage a data center?" It is clearly not a job for those who like a steady, unchanging routine day after day. It is also not the position for those who do not want to change themselves, since the DCM must grow with the job, expanding his knowledge and interest areas as the operating environment continually changes. The successful DCM takes a broad view of problems as they arise, assesses their impact in

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corporate terms, seeks new solutions and is not content with the attitude, "We've always done it this way."

The DCM's job involves continually examining the resources at hand (that is, the hardware and software installed and the people who operate them) and comparing them with the resources potentially available (that is, to vendor offerings in hardware and software and to the personnel in the marketplace). The results of this comparison must be matched against the expectations of the DCM's users, management and staff. Discrepancies between the realities and the expectations must be explained, rationalized or corrected.

To do his job well, then, the data center manager must be a skillful negotiator, be tenacious, work well with others, communicate clearly with top management, have an awareness of the business climate, be inquisitive and have a realistic outlook as to what can and cannot be accomplished. A good DCM should be able to respond positively to the following questions:

- Do you willingly seek a compromise solution to a problem?
- Do you attempt to compromise while persevering on basic principles?
- Can you talk easily with users? With data processing technicians?
- Can you relate well to a user manager's problems?
- Can you make a succinct case for gaining approval of a data center budget?
- Do you know what the company's operating results were for the last four quarters?
- Do you know how your company compares with competitors in terms of product line, sales volumes and profitability?

Every decision you make must be evaluated in terms of its overall effect. Thus, you must operate like a successful business entrepreneur, continuing to provide the best service at the lowest cost and willing to challenge all comers.

How to Run a Business

If you are a data center manager whose background is technical, you should make every attempt to expand your business skills. There are a number of ways to do this, including the following:

- Enroll in an evening business course (or courses) at a local college or university (especially accounting, marketing, finance).
- Obtain an MBA (several universities have intensive programs in which you attend one day per week while working or in which you take leave from work for 10 to 13 weeks).
- Enlarge your reading list (regular reading should include *The Wall Street Journal, Fortune, Forbes, Harvard Business Review*). Pay special attention to articles on organization, cost accounting, leasing and profiles on competitive companies.
- Go to a seminar on a non-DP subject (accounting for nonaccountants, motivation and contracting are perennially popular topics).
- Find a mentor, someone you respect in a management position. Observe how he makes decisions and handles personnel (hiring, firing, promotion, reorganization). Ask him questions, such as why he did or did not take a certain action.
- Mentally try on your boss's problems and job. Would you make the same decision your boss made?
- Establish and maintain a network of management contacts. Make a point of including several non-DP people in this network. Keep in touch with these contacts. Observe how they manage, how they run their business, what special problems they face and how they deal with their environment.

Applying This Information

1. Think through several recent decisions you have made that affected the data center. Select an example that dealt with hardware (such as installing additional disk storage units from your mainframe vendor), one that concentrated on software (such as selecting a data base management package) and one that involved personnel (such as deciding which of two people to promote to customer service supervisor for the data center).
   - Were these decisions made solely on their technical merit?
   - Were broader management impli-

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IN DEPTH

cations, such as customer service or rapid implementation, taken into account?

• Were you satisfied with the outcome?

• Faced with the same decision, what additional factors would you consider next time?

2. What information sources (newspapers, periodicals, seminars, meetings) do you have available that can give you a broad perspective on business, management and the activities of your company?

• Can these sources be used more effectively? Example: When an article appears about your company's line of business, make a point of discussing it with someone in management at your company. Find out how your company compares with the competition and with companies cited in the article.

• Is your management aware of your need for this information?

• Are there other sources of information you could use? Hint: Consider textbooks, autobiographies of business leaders and discussions with management personnel.

• Does your boss know of the specific management topics in which you are interested? Hint: If your boss knows of your interest areas, he can pass on information about these areas and may direct you toward meetings, seminars and conferences that will further your education.

3. Is your management aware of the demands for services that are being put on your data center? In other words, does management know who your top three users are, which user's data center work load is changing most dramatically (growing or shrinking), how much excess capacity is available in the data center and what your personal top-priority project is?

4. What is your management's general feeling about the amount of money being spent on the data center?

• Too much?
• Too little?
• Not getting its money's worth?
• Cost-effective?
• Don't know? (Better find out!)

5. What is your users' general feeling about the amount of money being spent on the data center?

• Too much?
• Too little?
• Not getting its money's worth?
• Cost-effective?
• Don't know? (Better find out!)

The successful DCM must control rising costs, manage rapidly changing technology, acknowledge the scarcity of well-qualified people, deal with an increased demand for service and be cognizant of competitive alternatives in the data processing industry. In other words, the DCM must function like a business entrepreneur, continually looking at the costs, benefits and effectiveness of the center and evaluating possible changes in personnel and processes. The goal of the DCM is to provide the best service at the lowest cost to data center "customers."

About the Author

Allan F. Froehlich is president of a management consulting firm in Waukesha, Wis., that specializes in the development and analysis of corporate data processing plans and operations, software evaluation and project management.

Froehlich lectures extensively on software selection and evaluation and coauthored The Software Buyers Handbook *for Guide. He also developed and conducts the University of Chicago seminar on Data Processing Operations Management, which has been presented throughout the U.S. and abroad and on which the book* Managing the Data Center *is based.*

Froehlich received a B.A. from Washington University and an MBA from the University of Chicago's Graduate School of Business.

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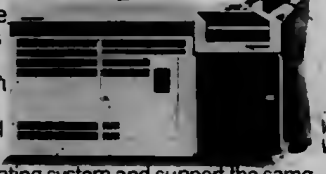

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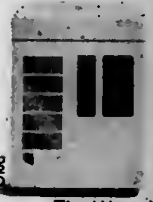

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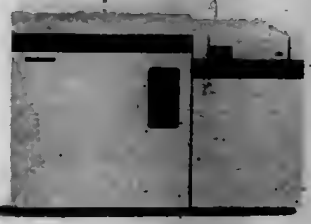

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EDITORIAL

Did Haste Make Waste?

U.S. District Court Judge Harold H. Greene deserves a great deal of praise for resolving in minimal time an extremely complex antitrust case, U.S. vs. AT&T. But did haste make waste once again?

The biggest winner, and possibly the only one, is AT&T. Not only has Bell divested itself of the highest cost, least profitable part of its business — the Bell operating companies — but it has been allowed to enter the vast and lucrative on-line information services business in exchange for this "sacrifice."

On the surface, equipment vendors made out pretty well, too. By cutting the link between the operating companies and Western Electric, AT&T's equipment manufacturing arm, and between the operating companies and Bell Laboratories, AT&T's research arm, Greene has opened the operating company market to independent suppliers. That, at least, is the prevailing perception.

However, as the Justice Department has pointed out, complex terminals like private branch exchange systems (and presumably those used for data transmission) require elaborate and expensive maintenance, engineering and other support. That means the operating companies probably will offer only a few brands at most. Western Electric clearly has an edge here, since the operating companies are staffed by AT&T-trained personnel who have well-developed working relationships with the Bell system.

Moreover, if the operating companies purchase equipment jointly, as they are encouraged to do by Section B of the final settlement agreement, it is questionable whether anyone but Western Electric could fill their orders. The independents could bid jointly, of course, but they might be stymied by Section C of the agreement, which requires Western Electric to fill operating company orders on a priority basis until 1987.

For competing long-distance carriers, the benefits of the AT&T settlement are even less apparent. They are guaranteed interconnection to operating company local exchanges on the same terms as AT&T Long Lines Division, but this equality will be phased in gradually between 1984 and 1986.

Most competing carriers will still be subject to the vagaries of AT&T rates because they lease circuits from Bell rather than operate their own facilities. And Long Lines will still be free to play anticompetitive games with those rates, assuming the Federal Communications Commission remains as effective as it has been and the other common carriers continue building only enough new transmission capacity to satisfy their short-term needs.

Where will all this leave the data communications user? Well, if divestiture does not increase competition among terminal vendors or communications carriers, the user's choice of suppliers — and its power to change their terms — probably will be no greater than it is today.

And if Bell extends its present monopoly into the on-line information services market, the user could end up worse off than it is today.

DATA PAST

Five Years Ago
Sept. 5, 1977

NEW YORK — AT&T's upcoming answer to public packet networks was a nationwide network handling "various protocols." The offering, to be called the Bell Data Network, will include communications processing services.

Ten Years Ago
Sept. 6, 1972

WALTHAM, Mass. — Honeywell, Inc. increased prices on equipment for users who were partially affected by the company's price hike last year. Some contracts did not permit the maximum increase authorized last year by the Price Commission.

'Watch closely! Now you see it . . .'

LETTERS

In Whose Interest?

Last year, our company signed a contract with a Big Eight accounting firm. The contract called for an equal number of programmers and analysts from each company. They have helped our shop upgrade standards and documentation procedures. We have also learned of some problem areas of which we formerly were not aware.

However, the system they are designing for us will not be the cure-all they say it will be. Already, before implementing the system, the accountants are dissatisfied with what they are getting. The Big Eight firm has swamped us with analysts, controlling all key project and management positions with their personnel and downgrading our analysts to programming positions.

When they leave, we will not have the needed expertise to maintain the system. Also, they have tried to discredit our present employees and always make the decisions independently of our company's analysts and accountants. If they receive any resistance from us, they go straight to the company's president — no one in our DP shop is allowed to do that.

This has tended to destroy our DP environment. Several of our best people have quit because of the contracted people's tactics. It is hard to watch things destroyed so easily by people who are more concerned with making a buck than with knowing a job was well done.

Name Withheld by Request

Begging the Question

Are DP managers really being persecuted by independent auditing consultants, as the editorial "Don't Quote Me" [CW, Aug. 9] suggests? The analysis of outside audits of DP departments makes several faulty assumptions that beg the question.

First, the writer assumes that the purpose of a consulting firm is to blindly approve all that is going on in the DP department. The fact is that consulting firms are brought in to ask hard questions and shake things up. They have a vested interest in change, not the status quo.

Second, the writer is shortsighted in assuming that DP departments have been singled out. Marketing, purchasing and finance are all subject to scrutiny, especially during a recession when there is overriding concern with improving profitability and productivity.

Third, *Computerworld* and, indeed, the entire industry separates DP interests from those of the corporation. There was a period in which DP departments were given free reign because the rest of the company was unwilling to accept the complex and often technical nature of their function.

At the same time, DP personnel were reluctant to simplify and demystify their operations and integrate them into the organization as a whole.

Because of this, DP departments were allowed to grow unchecked, and budgets were not questioned. The true function of the DP department is to improve the profitability and productivity of the corporation as a whole. Top management brings in a consulting firm to better integrate this function.

The challenge for DP managers in the future will be to manage their resources to meet corporate objectives. The so-called "managers" quoted in the editorial unfortunately did not rise to the challenge.

Patricia Joseph
Manager
Marketing Communications
Infotron Systems Corp.
Cherry Hill, N.J.

READER COMMENTARY / Jay Bloombecker

Limited Statutes Abet Unauthorized CPU Users

Imagine these facts: The data processing director and the systems programmer have become "silent partners" with the college for whom they work. The partners authorize the purchase of more and more hardware, but the system continues to fall behind. Student records and financial information back up. Unbeknownst to school officials, the college computer system now services commercial accounts.

A mail order house and a magazine subscription firm have paid almost $50,000 for the use of computer services and time. (No one has questioned the systems programmer's expensive house and cars on a $24,000 a year salary.)

Finally, a new data processing director comes on board and discovers unauthorized data files and unauthorized accounts. Carefully backtracking, the crime is reconstructed and a case is brought to the district attorney or the local police with a request for prosecution.

Case Study

A recent case (P.V. Weg Docket No. 1K023239 Part Ap-9, Kings County, N.Y.) suggests that under New York law, it probably isn't a crime and certainly isn't a theft of services.

The decision is not binding on other courts, being only the opinion of a trial court judge, but it addresses a question few courts have ever touched on and addresses it with a logic that is at least superficially compelling.

The logic of this case is broad. Not only New York, but all states with theft-of-services statutes will need to reconsider them in its light.

Ted Weg was not lazy. While working as a computer systems manager for the New York City Board of Education, he pursued other interests as well. Responsible for supervising and maintaining all computer programs and records for the board's Bureau of Supplies, he found computer time to add to the information in the board's computer.

He maintained:

- Data relating to the genealogies of race horses he and an associate owned.
- A mailing list and label program for a land owners association in Pennsylvania to which he belonged.
- His resume and a model cover letter.
- A program for production of purchase orders bearing the letterhead "Ted Weg, Data Processing Consultant" and his address.

Surprise Audit

Weg's files were discovered in the course of a surprise audit. His case was brought to the Kings County (Brooklyn) District Attorney's Office, and he was charged with violating New York's theft-of-services law. Specifically, the complaint alleges that Weg, the defendant, "diverted the use of said computer equipment [belonging to the Board of Education] to himself in that the defendant used the computer to record and retrieve data for his own personal benefit, none of which data relates to the Board of Education."

On April 14, 1982, Judge Michael Juviler, presiding judge in Part AP-9 of the Criminal Court of the City of New York, County of Kings, dismissed the charges. In what was later reproduced as a 12-page opinion, Juviler ruled that the theft-of-services statute was inapplicable to the facts alleged in the information. The key to the judge's decision is the definition of one phrase: "Business equipment."

He found that the board's computer was *not* business equipment, and thus no use of it would violate the theft-of-services law.

No court has considered this question before, Juviler noted, and thus he found himself forced to rely on the legislative intent he could infer. The statute arose in 1967 to plug a gap in the law.

Employees at a mill had not only pulled the wool over their employer's eyes, but had spun it on the company's looms. They escaped prosecution when the court hearing their case decided that the use of the machines was not property and thus the unauthorized taking of that use was not the taking of property forbidden by New York's law against larceny.

The addition of services as a special category of property did not go so far as to include all services, Juviler concluded. He quoted a draftsman's observation that "legislation of that character would doubtless lead to hosts of criminal charges of a basically civil nature."

Looking deeper into the New York law's history, the judge also pointed out that the American Law Institute's Model Penal Code, the source of many states' theft of services statutes, is limited in its application.

Section 223.7 of the Model Penal Code (Model Penal Code and Commentaries American Law Institute 1980) provides: "A person is guilty of theft if he purposely obtains services, which he knows are available only for compensation." An earlier version used the phrase "available for hire."

Thus the court concluded that New York's theft-of-services law was intended to apply "only to unauthorized use of equipment that is offered for use as a service in a commercial setting, such as for lease or hire, and was not designed to make it a crime for a public or private employee to use his employer's internal office equipment without permission."

As a matter of policy, the court in Weg noted that it would certainly be possible to make conduct such as Weg's criminal: "Perhaps computers are a special type of expensive, commonly used equipment, so subject to misuse that the legislature might wish to give their owners special protection."

However, unlike Illinois (and the other states listed in this issue) whose statute forbiding "unlawful use of a computer" are cited, New York lacks a computer crime law. Therefore the court concluded "unless Penal Law Section 165.15(8) is amended, it will apply only to unauthorized tapping into a computer whose service is for hire."

Bad Cases Make Hard Law

It is unfortunate that the first judicial interpretation of New York's theft-of-services statute should have come in the Weg case and not the case involving the college situation hypothesized above. In the real case, (described in the May/June 1981 issue of *Computer Security*), prosecutors avoided this question by charging the defendants with the theft of three terminals and services.

The case was resolved by plea bargaining. Looming behind the legal conclusions the judge drew are the arguably de minimus nature of Weg's abuse and the apparently wide-spread examples of abuses similar to Weg's. The information alleged no monetary or functional loss to the Board of Education and no economic gain to Weg.

(Continued on Page 46)

HUMAN CONNECTION / Jack Stone

Training New Terminal Operators: Cave-Man Approach Won't Work

One would think that training data processing professionals should be quite different from training entry-level terminal operators, but in practice this is not usually the case.

The approach employed for the former group might well be termed the "club-over-the-head" approach, one which, I understand, is somewhat akin to that used in prehistoric days for introducing new members of a tribe of cavemen to the technology for lighting a fire.

Surely this scenario is not altogether unfamiliar: The supervisor bumps into a DPer during a coffee break and notes offhandedly in a sugary sweet way: "Alice, we've got a problem with the accounts receivable system. I know you've been working almost exclusively in customer systems and are aware that accounts receivable is a mess, but could you bone up on it today and be ready to start work on it tomorrow? The documentation is scattered around somewhere and probably isn't complete, but I'm just sure you'll enjoy the challenge."

Champagne and Roses

So here's a champagne and roses salute to our DPers because, by gum, they so often succeed in meeting the challenge, but not at all in the way the typical supervisor envisions it.

What really happens is that a training assignment that should require, let's say, three full days in class is accomplished in perhaps six — or maybe nine — equivalent days in on-the-job training spread through the early life of a development project. Nevertheless, DPers, through the exercise of unusual intellectual powers, are somehow able to learn a system and conquer it at the same time — sort of like playing a 30XX-based Space Invaders video game — with not too bad results, all things considered.

This is the second article in a three-part series, "Trials of a New Terminal Operator," coauthored with Joannne Barker.

I've got news for you. Training in "cave-man" style really doesn't work all that well with DP trainees who may have some related background or education. But for terminal operator trainees with little preparation, it can be a real bummer, mainly for psychological reasons.

When reporting to work, whether apprehensive or exhilarated or skeptical or optimistic, these trainees are very susceptible to first impressions when interfacing with terminals on-line to a large and complex system.

What a "turn-off" for them when all they receive at start-up time is a few sentences of inspirational oratory from the supervisor; a set of highly detailed, indecipherable procedure manuals; a terminal with a weird-looking keyboard; a foot-high pile of source documents dumped in their laps; and a quick introduction to a colleague who is supposed to answer system inquiries but who talks so quickly and incomprehensively that it's too embarrassing for the trainee to repeat questions.

When you think about it, the bricklaying profession does a far better job at training newcomers to the lower rungs of their career ladder than the vast majority of DP centers. Most building trades employ a technique called "apprenticeship" wherein neophytes may work for weeks or months under the very close supervision of master craftsmen before they can qualify to start moving up the ladder.

The point is that subprofessionals in the data processing profession are not subhumans. From a personnel viewpoint, they deserve a proper share of management attention that too often is concentrated on the "super-techs."

From a hard-headed management viewpoint, it makes financial sense to plan a decent training program for them and recoup a lot more return on investments in them.

Letters to Stone should be addressed to him at Box 270, 1377 K St. N.W., Washington, D.C. 20005.

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Defining Computer Crime

(Continued from Page 45)

In contrast, the college case, involving the allegation of sale of almost $50,000 worth of computer time and clear business transactions on the part of the defendants, would have posed a much harder case for the court.

Perhaps most significantly, that case would have called into question the court's ruling that computers are not business equipment.

With the growth of the information economy, the idea that data processing is not part of a company's business becomes increasingly archaic. As consumers are forced to pay for data processing services in institutions like doctor's offices and banks, and as businesses choose whether to use in-house processing, outside service bureau help or wholly owned subsidiaries to do data processing, the demarcation between business and nonbusiness use of computers will seem harder and harder to maintain.

Is an airline's computer business equipment? Does it become business equipment only if the airline advertises "our lines are shorter because our computers are quicker?"

What about the wool mill, where New York's law began? Could today's employees use a computer that had process-control functions in regulating the speed of the mill? Could they use the computer that was used to regulate the temperature of the room where wool was spun? What about the computer that (like Weg's choice) maintained records of inventory and supplies?

Sure-Fire Solution

But why fuss and fight? A sure-fire solution is at hand. Let every data security manager get company commitment to my simple policy and you'll have the problem licked: Send a memo to all employees that says, "Henceforth any computer use not previously demonstrated to be in the company's interest shall not be performed without the prior payment of an unauthorized user fee of $10,000."

The same day that Weg was arrested, the office of the mayor of New York City issued an "Electronic Data Processing Security Statement of Policy." The statement directs that all city-owned or leased computer systems be used only for officially authorized purposes.

This statement brings us to the question of authorization to use computer services. Comments from other lawyers in *Computerworld* notwithstanding, the Weg case did not deal with this issue.

Even if Weg lacked authority (as the court apparently assumed), his acts would not be illegal, given the decision's rationale.

This issue of authorization will, however, loom large in cases where "business use" does not render it irrelevant. Unless use policies are articulated and followed, good arguments will be raised by many a defendant to the effect that his or her use took place with the knowledge or consent of the employers.

The legislature in New York has had the opportunity to enact computer crime laws. The New York State Bar Association's Subcommittee on Computer Law of the Committee of Business Law of the Banking Corporation and Business Law Section advised against passing a pending computer crime bill noting:

"If the current penal law does not adequately deal with this problem [of computer-related crime] modifications should be made which deter criminal behavior and provide reasonable assurance of prosecution and conviction. However, it is far from clear that an entire new article of the penal law needs to be added."

The Weg case seems to indicate that one of those necessary modifications is in the scope of "theft of services."

Another modification relates to penalties. If convicted, Weg would have been guilty only of a misdemeanor, and tha sentence would most likely have been minimal. Had the college case been prosecuted under the same statute, the punishment would have been the same.

It seems appropriate to ask whether more severe punishment should be an option in those cases in which use of a company computer results in a substantial loss to the user.

One last note, for the investigator, is the court's observation that a complaint in this case, (one which had been amended twice previously) was defective in that it did not allege that the computer was business, commercial or industrial equipment. (Had the complaint alleged the computer was a business facility, would the result have been different?)

The court also observed that the complaint failed to allege any facts supporting the requirement of an intent to derive a commercial benefit from the use of the Board of Education's computer.

In fact, the court noted that: "No facts are alleged in the information regarding tha use to which the defendant put the computer."

In short, great care must be used in filing a computer crime charge, particularly when the statute under which the allegations are raised is not a computer crime statute, but one which must be stretched if it is to establish a computer crime.

Industry reaction to the Weg case has been mixed. Many question whether unauthorized computer use should be handled by criminal means. None have pointed to a successful civil enforcement mechanism, and if pressed few could point to any generally recognized line of demarcation between acceptable and excessive computer use.

While industry considers whether computers shall be used without hesitancy by all those employees who read the Weg case, the various state legislatures of the U.S. and many foreign countries might do well to reach a consensus on this issue.

One thing seems clear. If you think a theft of services statute will protect against unauthorized computer use, you had better think again.

The Kings County District Attorney's Office has not appealed this case though it is clearly a novel issue worthy of appellate review. Several phone calls to that office have not been answered. Perhaps they are waiting for a case with more appealing facts.

Bloombecker is director of the National Center for Computer Crime Data in Los Angeles.

Improves Productivity, Health Care

Texas Department Grows Own Software

By Susan Blakeney
CW Staff

AUSTIN, Texas — A home-grown software system not only improved administrative productivity for the Texas Department of Health (TDH), but improved the quality of health care in the state as well.

Before the TDH created its Program Accountability and Reporting System (Pars), the transference of medical information through the big state's various local, regional and central offices consisted of a blizzard of manually generated forms.

With an increasing population, demands for better health care services and constantly growing standards of accountability, the TDH found that it could not operate effectively with the old manual system. Nor could the department accurately identify client needs in order to best direct its resources or track its various programs and employees activities.

The Pars system, which came out of its own DP department here, condensed reporting requirements onto two computer forms. One form accompanies the client through the clinic for recording each service obtained with its result. This client encounter form documents all necessary patient and services data and what special programs are charged for the service delivered to meet federal categorical funding requirements.

The second form, the employee indirect time report, records program time that is not spent in direct contact with clients as well as administrative time.

"Before we had Pars, doctors, nurses and administrators had to pour through six three-ring binders of instructions [to document patient care]," Eric Bindock, software manager for TDH, explained. "This system has been replaced by one 1-in. booklet . . . and most people only have to refer to a one-page cheat sheet."

One Region a Month

The TDH DP staff piloted the Pars concept back in 1980 on its Sperry Univac 400 system, but since then has grown to use a number of Univac 4020s and 4040s. "We're implementing one region a month now and will be completed by December 1982," Bindock claimed.

The system is based on the Univac systems at 12 points throughout the state, which feed data to the central TDH office in Austin. It performs off-line data entry, on-line processing, word processing, electronic mail and voice transmission.

Although still in infancy, it is estimated that Pars will replace 1,732,000 source forms per year, and 36,400 reports presently being submitted annually by clinics will be eliminated.

While dramatically reducing the amount of procedure learning and paperwork, the system has allowed administrators to capture, utilize and disseminate information on service delivery, fiscal management and program effectiveness. It has also rendered more effective reporting in meeting guidelines under federal grants, according to a TDH spokesman.

Bindock said that several universities and organizations have expressed interest in the success of Pars since the state auditors heralded it as the money saver it proved to be.

"It's condensed so much of the overhead into a very concise format — and that was its whole intention," Bindock reiterated. "This translates very nicely into how much time it takes people to do their jobs and how many cases of certain diseases have been reported . . . we're very pleased."

The Missing Link in System Specs — Part 2

User Groups Critical in Manual Design

By Louis Fried
Special to CW‡

Since the user manual is user-task-oriented, it must describe the work flow of the user step by step.

This can best be accomplished by observing the performance of a small group of users during the performance of their current tasks.

These workers should constitute a User Design Group (UDG) to participate in the design of the manual. They should be selected from among the best performers in the current mode of operation since they will be expected not only to describe their current work flow, but to contribute ideas as to how the work flow could be improved.

This level of worker involvement is critical to the future acceptability of the system and is a valuable aid to maintaining worker morale during and after the system development period.

The manual should be iterated through successive drafts with the UDG members until the majority agree on the accuracy and acceptability of the procedures.

When such tools are available, the analyst should introduce the UDG members to on-line screen design capabilities.

During the requirements definition phase (and, in fact, throughout the life cycle of the development project), it is valuable to have the guidance of a project steering committee composed of managers and key employees concerned with the system.

This is the concluding segment of a two-part series. This week Fried describes how the development of a user manual can help expand users' understanding of how their requirements will be met via a software system that is under development.

As the definition of procedures progresses, it may frequently be found that particular functions or facilities requested represent substantial cost increments when translated into hardware and software requirements. Such functions should be reviewed with both the steering committee and the UDG members to determine whether or not they are truly required or if alternative, less costly approaches can be used. Some idea of the impact in terms of cost and time must be provided for appropriate decision making.

Once the manual draft has been completed to the satisfaction of the UDG and the ana-

(Continued on Page 48)

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Input From User Group Critical in Manual Design

(Continued from Page 47)

lyst, a second worker group called the Design Review Group (DRG) should be appointed. This should be composed of less-capable workers currently performing the tasks covered by the system. Their task is to read the manual draft and mark up areas with which they disagree or which they do not understand. The draft is reworked with the participation of the UDG until it is understandable as a training document to the DRG members.

At this point, the manual draft becomes the foundation for technical and user reviews of the requirements definition. It is beneficial to involve selected members of the technical group, the UDG, the DRG and the steering committee in a walk-through of the procedures detailed. This is the final step in the requirements definition phase and, if successful, is the basis for the steering committee's authorization to proceed with the next phase of system development.

Knowledgeable Approval

Knowledgeable approval is based upon the clear evidence that the intended users understand what the system will do and how the system will do it. This will help the analyst obtain an agreement to "freeze" the requirements through the rest of the development cycle and will substantially improve the chances for meeting time and cost objectives with a relevant system product.

Preparation of the draft manual prior to the system design phase provides the opportunity for the requestor to develop a test plan, allocate sufficient manpower to the acceptance test, develop input to a test data base and develop transactions and transaction sequences well in advance of the acceptance test date. This early preparation pays off in better quality of testing and in an enhanced ability for the requester to ensure that the product being delivered is consistent with what was agreed upon.

Preparation of a draft user manual as a final part of the requirements definition can be a substantial aid in controlling system development time and cost, can reduce the potential for misunderstanding between the user and the system designer, can provide material for validating the system design and can support the means for ensuring the quality of the delivered product.

The manual's procedural approach ensures that all sources of information from outside the system have been considered and that all information needed by the users to perform their tasks or access data have been identified.

This approach also supports another extremely valuable portion of the system development cycle — that of system acceptance testing by the requester.

Traditionally, the requester is asked to perform an acceptance test prior to system implementation. This test assumes that the user will have constructed a test data base and an appropriate series of test transactions.

It also assumes that a test plan has been prepared according to the functional design of the system. However, it is very difficult for the user to create the data base and transactions without the detailed knowledge usually contained in the user manual, which is often the last document prepared by the system development team.

Fried is program director of thr Advanced Computer Systems Department at SRI International, Inc. in Menlo Park, Calif. This department performs research and consulting in the computer field. Fried's work has primarily been in thr areas of software architecture, office automation, data base management systems and software ergonomics.

Draft Manual: Its Advantages

By Louis Fried
Special to CW‡

There are a number of advantages and benefits that accrue from the use of a draft user manual approach:

- The analyst is able to obtain a real depth of user involvement in the definition of requirements.
- User participation in the design will improve the acceptability of the system to workers and reduce the "threat" of the new system in the perception of the workers.
- The user is able to validate the system requirements because they are stated in a user language and deal with actual user tasks and work flow.
- The manual draft provides a foundation for technical and user walk-throughs.
- The sequence of events in creating the draft affords the opportunity to evaluate trade-offs in function vs. development time and cost.
- If created on-line, the manual can eventually be used for user training and reference in an interactive mode and can be maintained more easily.
- The analyst is able to obtain informed user agreement to "freeze" the requirements definition through the development of the system.

This approach also provides a basis for validation of the system design. Descriptions of edit rules and computational algorithms contained in the manual are directly translatable to program module descriptions. The identification of the most frequently used transactions and functions forms a basis for planning the design of the data bases for the system in a manner that will optimize response time to the user. In addition, detailing the interaction, feedback messages and on-line help for the users ensures that system-generated messages and instructions are in a language that the user will understand.

Ingres Relational DBMS Now Out for VAX-11/Unix

BERKELEY, Calif. — Relational Technology, Inc. (RTI) has announced a Digital Equipment Corp. VAX-11/Bell Laboratories Unix version of its Ingres relational data base management system (DBMS).

The firm also announced enhancements to its VAX/VMS version to support journaling, audit trails and the use of its forms management system from high-level programming languages.

Ingres Version 1.1 for VAX/Unix includes RTI's Report Writer and Forms Management System, including a Query and Update by Forms subsystem, Visual Forms Editor, documentatioo and support. The price of Version 1.1 is $35,000.

Ingres Version 1.4 for VAX/VMS includes a journaling facility to save updated records to a second disk automatically and to support full data base recovery after hard disk crashes. Version 1.4 also supports high-level calls to its forms management system from procedural programming languages.

Version 1.4 has been distributed free to all current Ingres users, an RTI spokesman said from Suite 515, 2855 Telegraph Ave., Berkeley, Calif. 94705.

S/SE 'Trac' Regulates TSO Logon Access

MOORESTOWN, N.J. — Systems/Software Engineering (S/SE) has announced a TSO resource allocation control (Trac) product that is designed to manage and increase the effectiveness of the flow of time-sharing access to a computer system.

Trac provides logon access to TSO for only a specified number of users in any given department, reportedly assuring adequate response time and guaranteeing access to TSO across user groups. The software exists as a front-end to TSO logon and is compatible in all TSO environments, an S/SE spokesman said.

The package is table-driven from a dynamic memory list of user identification subsets and provides maintenance and diagnostic functions for authorized users, the spokesman said.

The Trac software is compatible with such security software as ACF2 and RACF and incorporates a user-exit for added functions, the spokesman noted.

For a limited time, Trac is available on a 30-day free-trial basis. According to the vendor, the initial price is $6,500.

S/SE is headquartered at 304 Harper Drive, Moorestown, N.J. 08057.

NYU Puts Ada On Processors With CMS, MVS

NEW YORK — The New York University (NYU) Ada/Ed implementation of the Ada programming language for IBM VM/CM5 and MVS operating systems was introduced here.

Describing Ada/Ed as the "first reasonably complete implementation" of Ada that is "generally available," an NYU spokesman explained that the purpose of the Ada/Ed effort has been to produce a full description of the language in the form of a running program or interpreter.

Ada/Ed can be read as a document describing the language itself and can also be executed as a program to provide "concrete, pragmatic answers to questions about the meaning of an Ada program," the spokesman said.

Designed primarily for training and educational purposes, the current version of Ada/Ed supports Ada as defined by the U.S. Department of Defense July 1980 reference manual. NYU has begun to upgrade the implementation supporting the final version of the language, Ada '82, the spokesman continued.

The VM/CMS and MVS versions require a virtual region of at least 5M bytes and are available from NYU at a cost of $250 for academic sites and $1,000 for nonacademic sites.

For further information, contact Ada Project, Courant Institute, 251 Mercer St., New York, N.Y. 10012.

Factory System Gets Microfiche

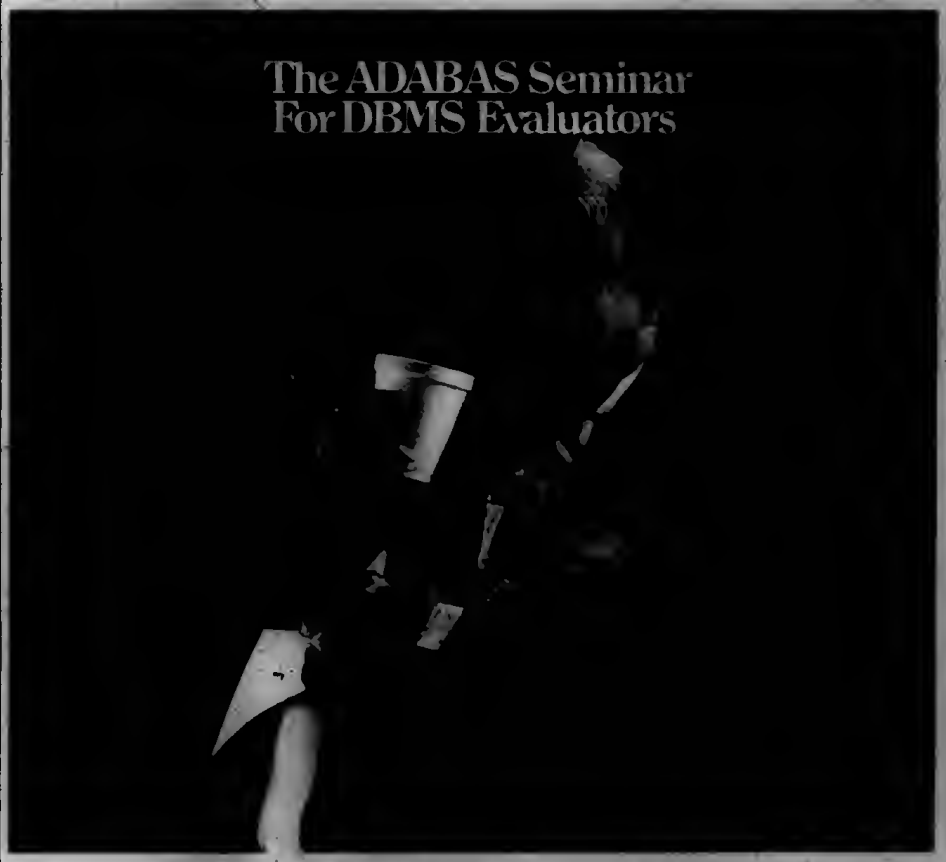
MILWAUKEE — A.O. Smith Corp. has announced a microfiche function with Version 3.2 of its Manufacturing Data System for IBM and compatible mainframes.

Microfiche is printed from a computer-generated tape following the execution of Manufacturing Data System run. The fiche is delivered to the user within 24 to 48 hours, and multiple copies can be printed.

Each microfiche card can hold the equivalent of 277 printed pages.

Typically, each microfiche card costs $2 to $3, the vendor said.

More information is available from A.O. Smith at 3533 N. 27th St., Milwaukee, Wis. 53216.



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'Listcat Plus' Update Eliminates Idcams Utility

FAIR GROVE, Mo. — MacKinney Systems has announced Release 5 of Listcat Plus, which is said almost to have eliminated the need for Vsam users to use the Idcams utility for printing Vsam catologs by adding more information to the reports it produces.

The Listcat Plus reports reduce printout size by a factor of 60 to 1 over Idcams Listcat and give the Vsam catalog information in an easier-to-read format, the vendor said. The product also prints a volume summary report that is used for managing Vsam space. Listcat Plus licenses for $395 and leases for $99 yearly. MacKinney Systems is at Rt. 2, Box 270A, Fair Grove, Mo. 65648.

Altergo's On-Line Query Facility End-User-Oriented, Menu-Driven

BOSTON — An end-user-oriented on-line query facility has been announced by Altergo Products, Inc.

The Friendly Query System (FQS) is menu-driven and provides access to data under either the IBM CICS or Altergo Shadow II teleprocessing monitors. The heart of FQS is a data dictionary said to list the definitions of files and records available for query under the system.

In addition, it is said to serve as the security control unit, protecting data items on a password basis from unauthorized access.

FQS runs as a transaction under CICS/VS or Shadow II with the DOS/VS(E), OS/VS1 and MVS operating systems.

FQS costs $9,800 for the DOS version and $12,000 for OS, an Altergo spokesman said from Suite 803, 211 Congress St., Boston, Mass. 02110.

Adabas-M Users Get Support For C Language

RESTON, Va. — Software AG has announced support for the native-mode C language for Adabas-M data base management system users on Digital Equipment Corp. VAX-11/730, 750 and 780 systems running under VAX/VMS.

Users may interact with the system in four ways: by calls from on-line or batch programs; from terminals using the Adascript-M query facility; via terminals or batched commands with the Report Writer; or through the interactive data base administrator utilities.

User-written application programs can be in any of the 32-bit VAX-11 languages including Basic, Blis, C, VAX-11 Fortran, Macro-32, Pascal and PL/I.

Adabas-M is available for $40,000 on a CPU license. It can also be leased on a variety of plans. Software AG is at 11800 Sunrise Valley Drive, Reston, Va. 22091.

'CMIS' Upgrade Fits System/34

TAMPA, Fla. — Data Management Services, Inc. has announced Version 5.0 of its Contractors Management Information System (CMIS) for IBM System/34 processors.

Features include interactive data entry, job queue processing and automatic restart/recovery protection against power failures. Applications include payroll, accounts payable, accounts receivable, general ledger, job costing, contract status, inventory and billing, the vendor said.

Version 5.0 of CMIS costs between $10,000 and $30,000 depending on the applications. The vendor is located at 9501 E. Hillsborough Ave., Tampa, Fla. 33610.

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Three Inslaw Packages Track Court Cases

WASHINGTON, D.C. — Inslaw, Inc. has announced three software packages for applications involving case management by juvenile justice officials, civil and criminal courts and corrections authorities.

Called Youthtrac, Docketrac and Jailtrac, the packages are part of the vendor's Gentrac line of tracking systems. The packages run on a variety of processors, including Burroughs Corp. B1800 and B1900 processors using Burroughs' MCP operating system; Digital Equipment Corp. VAX-11 series processors using the RSTS operating system; IBM 4300 and 370 series processors in either DOS or OS environments using CICS; and Wang Laboratories, Inc. processors using the VS operating system.

Youthtrac was designed to automate the case management functions of juvenile, justice and other agencies involved in processing juveniles. The package tracks referrals, youths, juvenile status offenses, delinquency charges, court event, parents, guardians, supervisors, witnesses, police officers and case workers. The package costs $55,000, the vendor said.

Docketrac is an on-line docketing and calendaring package that performs scheduling functions and tracks cases, litigants, other parties and events from filing to final disposition. The package costs $35,000, the vendor said.

Jailtrac supports daily operations of booking agencies, pretrial release programs and jails other than detention centers. The system captures, maintains and retrieves information about arrestee bookings into the facility. Features include automatic release date calculation, inmate fund accounting, visitor control, incident reports, booking and arrest forms and a full historical record of an inmate's incarceration. The package costs $55,000, the vendor said from Suite 600, 1125 15th St., Washington, D.C. 20005.

'Saver RSTS/E Disk Backup' Eases Handling of Magnetic Tapes

PLACENTIA, Calif. — Data Processing Design, Inc. (DPD) has released the Saver RSTS/E Disk Backup system to make the handling of magnetic tapes easier for operators who are backing up information from disks onto tapes.

Saver Version 2.6 reportedly supports Versions 7.0, 7.1 and 7.2 of RSTS/E, an operating system that runs on Digital Equipment Corp.'s PDP-11 minicomputers.

In Version 2.6, the image of the tape bootstrap has been moved from SAVER.DPD to a separate file, making it easier to change Saver for new versions of RSTS, the vendor said.

The product is priced at $850 for new customers and is available free of charge to all current supported Saver users.

DPD is located at Suite F, 181 W. Orangethorpe, Placentia, Calif. 92670.

'Journal Plus' Extends 'Mapics'

DANVILLE, Calif. — P.L.A. has announced Journal Plus, which reportedly extends the capability of IBM's Mapics general ledger software for the System/34.

The product provides a facility for creation and maintenance of recurring journal entry sets that can subsequently be selected to create one or more diskette journal entry batches for Mapics posting, the vendor said.

Journal Plus also allows for two distinct types of journal entries — regular entries where dollar amounts are keyed for up to 99 debit and/or credit accounts and distributed entries where a single keyed amount can be allocated on a percentage basis to up to 99 debit and/or credit accounts, the vendor said.

The product requires no modification to the Mapics programs or procedures, the vendor claimed. It is only necessary to request at least one diskette batch at the time the Mapics G/L questionnaire is run.

According to P.L.A., the price for Journal Plus is $495 for a one-time license fee.

The vendor is located at Suite 200, 181 Emmons Canyon Lane, Danville, Calif. 94526.

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File Utility Fits DG Nova, Eclipse

WINTER PARK, Fla. — Data Tap, Inc. has announced a file maintenance utility called Speedsort and Select for users of Data General Corp. Nova and Eclipse processors running the Rdos operating system.

The package is said to reduce the need for indexed sequential access method (Isam) file structures. The utility includes a speedsort function that can sort up to 14,000 record/min. A select function can select up to 40,000 record/min. A record reformat function and multicriteria select function are also included, according to the vendor.

The package costs $3,000, the vendor said from 900 Orange Ave., Winter Park, Fla. 32789.

For NCR's Imos III, Imos V, IRX, VRX

'Cogen' Said to Generate Debugged Cobol

CINCINNATI — Software Clearing House is offering Cogen, a tool for generating debugged Cobol programs.

The product, developed by Bytek, is said to operate under NCR Corp.'s Imos III, Imos V, IRX and VRX operating systems.

Cogen's "screen builder" allows the programmer to paint an image of the desired screen format and then answer simple questions about the name and editing to be applied to each data field on the screen, the vendor said.

The product reportedly can produce complete Cobol-74 programs that can add, delete, modify and report from multiple files using multiple screen formats without any programming.

The firm claimed it ran a benchmark on an NCR 9020 using Cogen to generate a complete file maintenance application, and 281 lines of bug-free Cobol-74 were produced in 14 minutes with 347 keystrokes.

For NCR "I" systems, Cogen is available for $3,650; for "V" machines, the price is $4,400. The product is available from Software Clearing House, 771 Neeb Road Cincinnati, Ohio 45238.

Applications Developer Out for NCR

PACHECO, Calif. — An interactive system for on-line applications development on NCR Corp. mainframes has been announced by Century Analysis, Inc.

Impact/6 reportedly enables logic, file and display generation to be handled interactively. The need for batch functions, including compiles, link-edits and file-access utilities are eliminated, the vendor claimed.

Impact/6 can be used on any NCR Century 251, 300 or Criterion System running under the B3, B4 or VRX operating system. Full training and documentation are included in the $29,500 price, a spokesman said from 114 Center Ave., Pacheco, Calif. 94553.

HP 3000 Gets Two Packages

TAMPA, Fla. — Collier-Jackson, Inc. has introduced a newspaper Advertising Information Management (AIM)/3000 system and a Personnel Resources System (PRS)/3000 system for the Hewlett-Packard Co. HP 3000 computer.

AIM/3000 offers analysis of sales, historical trends and budget comparison, as well as actual, unit, equivalent and standard linage analysis. The software costs $26,000 to $56,000, depending on the circulation of the newspaper, the vendor said.

PRS/3000 is said to handle storing and retrieving of personnel information, current and historical job-related data, job status data, skills inventory, attendance and resume information. Attendance, benefits and federal Occupational Safety & Health Administration and Equal Employment Opportunity reports are also generated by the system.

PRS/3000 costs $24,000 from 5406 Hoover Blvd., Tampa, Fla. 33614.

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• INTEGRATED SYSTEMS provide balanced data with single entries.	• SEPARATE SYSTEMS duplicate work and increase out-of-balance risks.
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Micro Notes

Electronic Mail Services Co. has announced a computer-originated mail service that is reportedly sanctioned by the U.S. Postal Service. Called E-Com, the package handles data gathering and transmission to the post office. On arrival, messages are printed and inserted into an envelope and processed with the post office's assurance of two-day delivery, the firm claimed. The package costs $300 and is available for Radio Shack TRS-80 Model I and III processors, the vendor said from the Suite 708, David Whitney Building, 1553 Woodward Ave., Detroit, Mich. 48226.

Softech Microsystems, Inc. has announced Xenofile, a package designed for users of the Regents of the University of California USCD-P system. The package translates files written for Digital Research, Inc.'s CP/M operating system for the P-System. The package does not, however, allow the P-System to execute CP/M programs (or vise versa), the vendor said. The package costs $50 from 9494 Black Mountain Road, San Diego, Calif. 92126.

Software and Systems Technology, Inc. has announced Irconv, a conversion utility to convert programs written in Intel Corp.'s Isis operating system to be compatible with programs written in Intel's IRMX operating system. The package performs FORMAT, WRITE and DIRECTORY LIST functions. The package costs $350, the vendor said from Suite 626, 7700 Edgewater Drive, Oakland, Calif. 94621.

Strobe, Inc. has introduced a shape and text processing package for all Apple Computer, Inc. and Osborne Computer Corp. computers. Strobeview costs $75 from the vendor at 897-5A Independence Ave., Mountain View, Calif. 94043.

From Business & Professional Software, Inc. comes a Plotter Installation Kit (PIK) said to print the graphics produced with either the Apple Computer, Inc. Apple II or III directly on Strobe, Inc. 100 plotters. PIK costs $150 and is available from Apple dealers. Quantity discounts are available, a spokeswoman said from the firm at 143 Binney St., Cambridge, Mass. 02142.

Abacus Associates, Inc. is offering Viz.A-Con, namely a consolidation system, for users of Visicorp's Visicalc. The software is said to allow the user to combine multiple "pages" of Visicalc data from a model for hierarchical consolidations or summations over time. The package runs on Radio Shack's TRS-80 Model I/III and costs $89.95 from the vendor at 6565 W. Loop South, Suite 240, Bellaire, Texas 77401.

Forth, Inc.'s multilevel Polyforth II software, said to replace the two-year-old Polyforth, features a video prompting display system and reportedly allows the user to select the support level he needs. Polyforth II costs between $300 and $10,000 from the firm at 2309 Pacific Coast Hwy., Hermosa Beach, Calif. 90254.

A full-screen editor for the IBM Personal Computer running under IBM's PC disk operating system has been introduced by Nota Bene Software. Said to be suitable for program development, data entry and word processing, Another Full Screen Editor costs $29.95 from P.O. Box 497, Glenview, Ill. 60025.

Muse Software, Inc. has released its SuperText 40/56/70 column word processor software, said to turn the Apple Computer, Inc. Apple II with 48K and disk drive into a word processor. The package costs $125 from the firm at 347 N. Charles St., Baltimore, Md. 21201.

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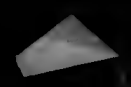

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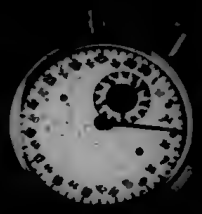

Compression Utility Out For Series/1 Under EDX

LOUISVILLE, Ky. — Infosystems Design Corp. has announced a compression utility for IBM Series/1s running under EDX.

SQSH is said to use 70% to 79% less space on disk or diskette and to speed and simplify source code backup procedures. Up to 32,000 lines reportedly may be stored on a double-density diskette, according to the vendor.

The menu-driven SQSH is said to utilize a partitioned data set (PDS) format for storage of compressed files so that in effect the PDS becomes a library of source or documentation files, according to the vendor.

The utility costs $195 from Infosystems Design at 4229 Bardstown Road, Louisville, Ky. 40218.

TI Offers Updated Version of Basic

DALLAS — An enhanced version of the Basic programming language said to be up to twice as fast as previous Texas Instruments, Inc. releases has been announced by the firm.

TI Basic is said to add flexible report formatting, internal computations in decimal and file support needed for business applications. The language also includes interactive development and debugging capabilities along with program security features.

TI Basic reportedly allows users of a single-user TI Business System 200 computer to support large Basic programs with a limited amount of memory because portions of the program can be kept on disk when not in use.

The language is compatible with TI's existing DX10 Basic and provides a migration path from Small Business Computer (SBC) Basic. TI Basic is free to DX10 users. The price ranges from $700 to $3,250, depending on medium and operating system. TI can be reached through P.O. Box 202146, H-630, Dallas, Texas 75220.

Productivity Tool Uses HP 'Vplus' For Applications

MOUNTAIN VIEW, Calif. — Computing Capabilities Corp. has announced a productivity tool for developing interactive on-line applications using Hewlett-Packard Co.'s Vplus standard forms management software.

Demon is said to require no programming to implement systems using an existing Image Data Base and Vplus form file. By filling in the parameters on a transaction screen, users reportedly can create on-line transactions that perform add, change, delete and inquiry.

Demon costs $2,800 from the firm at Suite 223, 465-B Fairchild Drive, Mountain View, Calif. 94043.

'Phimod' Updated For Wang CPUs

RICHMOND, Calif. — Soft Pro Systems, Inc. has announced an enhanced version of its Phimod/Cobol package for the Wang Laboratories, Inc. VS processor.

Version 3.01 of the financial model spreadsheet analysis program features copy row/column, move row/column, redefine existing work sheet parameters, option order on calculation and formula print capabilities.

The software costs $1,490 from Soft Pro, 4121 MacDonald Ave., Richmond, Calif. 94805.

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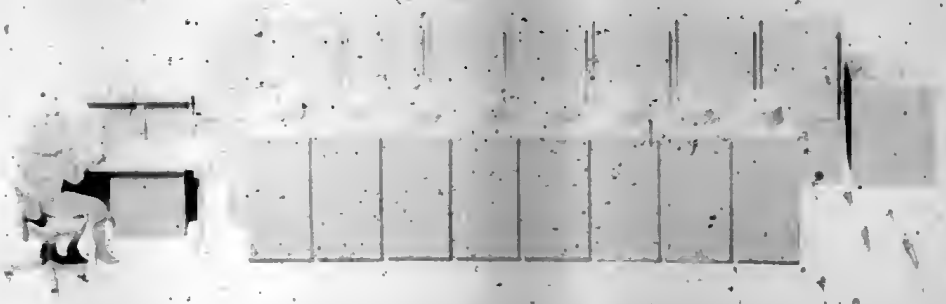

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Components fail. But that doesn't necessarily have to mean downtime. With a NonStop network from Tandem, you're assured of completely reliable system operation—right through a component failure that would shut other systems down. The result is that you get the right information to the right people at the right time. Across the street or around the world. Without fail.

The network is based on the continuous processing capabilities of Tandem NonStop computer systems—a fault-tolerant environment in which a malfunction or component failure will not inhibit or interrupt system operation.

With a Tandem system, you can access information from anywhere in the network, in different formats (text, data and images), integrate all the information in a form that meets your specific requirements, and distribute the finished product at the appropriate times to any number of recipients at any number of locations. Those receiving the communication can 1) interactively add or delete information; 2) forward it to other individuals or send it back to the originator; 3) print it out; or 4) store it for future reference. Or any combination.

And in a Tandem network, all the advantages of NonStop system availability become NonStop network availability. If a line failure occurs, our advanced networking software transmits the message over the optimum alternative path—transparently to the user, of course.

But the result is always the same: your information gets through. Without fail.

DEVELOPING THE INFORMATION

As the nature of doing business on a large scale becomes ever more complex, so does the nature of the information behind it. Not only is this information in many different formats, it is typically widely dispersed throughout an organization. With most systems, that means throughput problems for those users in remote locations who need only occasional access to it.

Not so with Tandem.

The wonders of a distributed, relational database.

Unlike other approaches to distributed processing in which each location functions as an independent database, Tandem treats the network as one single database with multiple files distributed geographically. Programs will run with files from anywhere in the system, whether you have a single two-processor system or a 255-system network. And with no user intervention or special programming required.

The key is the relational organization of the database—an extremely flexible design concept that's also extremely easy to work with. Setting up files merely involves creating or filling in tables with pertinent data. So you save time and money right from the start on program development and maintenance. And to expand, you merely add new tables or add more rows to existing ones—without rewriting or modifying your applications programs. This lets you concentrate on the application at hand, not on system organization.

MOVING THE INFORMATION

Most business information systems are configured for the purpose of automating the tasks normally associated with office work: writing, printing, filing and distributing information within a local area.

THIS NETWORK WORKS

Tandem processors complement each other, working together to increase power, performance and throughput for a lower total cost per transaction. Adding NonStop fault-tolerant operation to advanced networking capabilities, the Tandem system virtually eliminates the risk of network failure. At the same time, it protects the database from damage caused by electronic malfunctions. And when a component does fail, the system can be serviced—parts removed and replaced—while continuing to process transactions. So your message is guaranteed to get through. On time, every time. And over the widest range of communications circuits, too: X.25 packet-switching networks, terrestrial circuits, fiber optics, even satellite links.

The ins and outs of transmitting data.

Tandem's comprehensive set of communications products protects your investment in other mainframe, mini, and peripheral products. The Tandem system supports BISYNC, ASYNC, SDLC and HDLC basic communications protocols. There are also a variety of software packages that allow a network of Tandem systems to be linked to other mainframes or networks (including SNA) for the support of interactive processing and remote batch processing.

In addition, the Tandem system can be interfaced to a wide range of terminal products such as text processors, ATMs, cash registers, badge readers, optical scanners and shop floor terminals.

Words and images.

Tandem's special facsimile software lets you store and forward facsimile reproduction of charts, graphs and diagrams to accompany text from various data files. And, you can access this information from any telephone with a facsimile machine. What's more, this ability to transmit graphic elements also greatly enhances our unique Query/Report Writer capability—the only such software on the market that optimizes both functions over a distributed database.

The speed of light.

Using state-of-the-art optical technology, our high-speed fiber optics extension provides the means to link Tandem processors up to a distance of 1000 meters between individual systems.

In effect, you can link up to 224 processors within your headquarters or plant, giving you an extremely fast and efficient system that provides enormous processing capability. And of course, you can interconnect this system into your network for expanded information-sharing capabilities.

The sky's the limit.

The lower costs and higher reliability of transmitting data over long distances via satellite is an economical and practical alternative for any corporation with geographically dispersed locations.

That's why Tandem has joined with American Satellite Company (ASC®) in a unique marketing agreement to provide the only completely fault-tolerant satellite communications network on the market today. So you can be assured of total NonStop system reliability, from operating system to orbiting satellite.

Following the NonStop system strategy, earth stations transmit and receive data over two parallel paths—if one is down, the other is still operational.

Also, ASC provides two different transponders on the satellite itself. Again, should one be inoperative, the second transponder and data path continue to function.

ASC provides the earth stations, including a special antenna that is small and light enough for mounting on a rooftop or in a parking lot. This can be directly connected to the computer system, without need of leased lines, for lower costs and

higher dependability. Tandem supplies all other ground components, including controllers, RF modems and complete computer/communication interface modules, all of which were designed with solid state technology for outstanding reliability. And, since Tandem maintains the entire system, you always have only one number to call for the answer to any question.

Putting it all together.

With a full range of communications capabilities and the enormous capacities of a global system, the Tandem NonStop™ network is uniquely suited to the complete information requirements of multi-divisional, multi-national corporations. And most especially for any business or institution that needs to get the right information to the right people at the right time. Without fail.

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The Tandem Evolution—an evolution in products and strategy that integrates information and communications in a single virtual NonStop system. A system with the flexibility to adapt as time, markets or economic considerations change. A reliable network that links people, equipment and data independent of location, application, form of data, method of transmission, number of users or types of equipment. An evolution that from beginning to end protects your investment in information resources.

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Tandem provides local sales and service support in the major computer markets throughout the free world. Plus fourteen software education centers in the U.S., Canada and Europe offering professional technical training courses for your programmers and analysts. With this kind of support behind each new capability, applications can be implemented on-line quickly, easily and economically.

If you'd like more information, call your local Tandem sales office listed on the back cover. Or contact Tandem Computers Incorporated, 19333 Vallco Parkway, Cupertino, California 95014. Toll Free 800-538-3114 or (408) 725-6000 in California.

The system shown is a sixteen processor system. It can function independently or as the local node of a 255-system network, more than 4,000 processors, providing direct and immediate access to information sources anywhere in the world.

When you need it without fail, there is only one.

TANDEM

But communicating this information in a timely, reliable manner outside that area is another problem entirely. If you don't know beforehand precisely which locations are to be included in your network, you'll pay a stiff penalty in reprogramming and restructuring costs when you want to add nodes or change them around.

That's where the Tandem difference is so important.

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The Tandem system was designed from the start to be a single, flexible network. No matter what the configuration. Or how many times you change it. A simple two-processor system at one physical location may be thought of as a network, just as a 255-system configuration spread across the globe is a network. The very same network, at that. This concept of a *total* information/communications system results in significant time- and cost-saving benefits for the system designer. And ultimately, for the user.

Plenty of room to grow.

System expansion is easy and economical. Thanks to the network's modular construction, moving up to larger configurations is simply a matter of adding hardware, piece by piece, as requirements dictate. You start only with what you need, and add processors, peripherals and communications facilities in low-cost increments. And without having to rewrite a single line of software. That means your original investment in equipment and programs is always protected.

The right information to the right people at the right time.

The Tandem NonStop network integrates all devices into a single virtual system. This provides a framework for information handling that is independent of both content and

time. Each user can send, query, receive, store, secure, forward and distribute information at his or her own terminal. Including information from the database and images from a facsimile machine, and the user's own ad hoc memos. The system assures that the information will reach its destination at the user-specified time. And that's what effective communication is all about.

On a Tandem network terminal in the Dallas office, a sales representative accesses the corporate database to draft a qnote document for presentation to a customer in London. Meanwhile, the San Francisco and Chicago offices respond to a separate "electronic memo" by sending charts on the customer's sales activity and copies of faxed news stories and photos. After product inventory figures from the Atlanta warehouse are added, the complete report is transmitted to corporate headquarters in New York, where the document is reviewed and a cover letter drafted. Finally, with a few simple keystrokes, the entire package is sent in seconds to the London sales office, with copies to New York and Dallas for storage on file. Thus, the full resources of the system are put to work for effective corporate information management.

For information on any of Tandem's computer products, contact the sales office nearest you.

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The Statcon Series 21 combines the CS21 series multiplexer with CM22/EX port concentrator.

Mux/Port Concentrator Series Exploits Emulex CS21 Line

SANTA ANA, Calif. — Emulex Corp. has introduced a multiplexer/port concentrator series that reportedly takes advantage of the vendor's CS21 multiplexer series and adds microprogramming to provide demultiplexing capabilities for funneling remotely concentrated data into a single RS-232 port.

With the Statcon Series 21, up to 32 local and remote lines may be connected to any Digital Equipment Corp. PDP-11 or VAX-11 computer system using a single backplane slot without any user modification of standard software, the vendor said.

The CS21/MX host multiplexer and its companion CM22/EX local statistical port concentrator have been programmed to provide demultiplexing functions transparent to users.

Each remote link is said to plug into one of the 16 local RS-232 ports. The remaining RS-232 ports can be allocated to local asynchronous line applications.

A minimum Statcon Series 21 configuration includes a single CS21/MX computer interface printed-circuit board, a CP/21 16-port distribution panel and a CM22/EX statistical port concentrator without modem. That configuration costs $6,300. Additional port concentrators may be added at a cost of $2,200, without modem capability.

Emulex is at 2001 E. Deere Ave., Santa Ana, Calif. 92705.

TI Supports X.25, Expands Networking Of Mid, Upper Line

AUSTIN, Texas — Texas Instruments, Inc. has expanded the networking capabilities of its mid- to upper-range business computers with the announcement of support for the X.25 packet-switching communications protocol.

To enable a TI business system user to take full advantage of available networks, the company has developed the Distributed Networking Communications System (DNCS) X.25 Remote File Transfer (RFT) package.

DNCS X.25 RFT is said to allow the appropriate computers running under the Dnos operating system to function either as a host or satellite station communications sessions over leased lines or public packet-switched data networks.

In addition, when a packet-switched data network serves as the communications medium, users can take advantage of various added value features offered by the network — such as closed user group operation or reverse charging, TI claimed.

Beyond that, multiple "virtual channels" can be opened between the transmitting station and a large or small number of recipients, all of which can be communicated with simultaneously.

When leased telephone lines are the communications medium, users with high-volume applications can take advantage of the advanced error-recovery characteristics of the X.25 protocol. An X.25 installation can also be migrated to packet-switching mode when required without a change of hardware, a spokesman said.

The transfer of data or program files between TI systems reportedly can be initiated either from a workstation or a user program without the intervention of an operator at the secondary sites.

The inherent logical multiplexing capability of the X.25 protocol enables the transmission of several files concurrently around the network. Files can be sent to update an existing file location or to create and load new files automatically.

DNCS X.25 RFT also provides the following network management functions: allocation of the number of virtual channels, determination of access rights to the files being transmitted and analysis of the communications statistics that determine the most economical way to use the public network.

DNCS X.25 RFT can co-reside with other communications emulators under Dnos including DNCS Systems Network Architecture.

The single-unit price for the DNCS X.25 RFT software license is $3,500. The product can be installed in Business System 600 configurations and existing DS990 models.

It will be available in the fourth quarter of this year, according to TI. The vendor can be reached through P.O. Box 202146, Att: H-631, Dallas, Texas 75220.

Microcontroller Out for VAX-11s

IRVINE, Calif. — Able Computer Technology, Inc. has announced the Able VMZ/32, a 16-line communications microcontroller for 32-bit Digital Equipment Corp. VAX-11 series processors.

The unit gives VAX-11/730, 750 and 780 users a chance to optimize the direct memory access capability of Version 3 of DEC's VMS operating system, a spokesman for Able Computer said.

The VMZ/32 consists of a single hex-width board, a distribution panel and interconnecting cables. It installs into any DEC DD11 backplane and contains two 8-line multiplexers programmed to emulate the asynchronous line functions of two DEC DMF32 controllers.

An optional 16-line adapter permits selection of EIA or current loop operation on a line-by-line basis, the spokesman noted.

Current users of the firm's Able VX/DZ controller can buy a field upgrade package for $750.

The VMZ/32 costs $4,250. Able Computer is located at 1732 Reynolds Ave., Irvine, Calif. 92714.

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Multidrop Data Router Out For Systems Using RS-232

MINNEAPOLIS — Park Computer Corp. has announced the Multi-Port 232, a multidrop data router for systems using an RS-232 protocol.

The four-channel unit is said to eliminate cable plugging and allow merging or splitting of RS-232, fiber-and current loop data in any source/destination combination, the vendor said.

The unit can be used to expand existing systems with flexible data exchange. It provides local networking for word processors, printers, modems, video displays, processors, teletypewriters and other instruments, the vendor said.

The Multi-Port 232 costs $435. Additional ports, fiber-optic or current loop interfaces are optional, the vendor said from P.O. Box 13010, Minneapolis, Minn. 55414.

Ascii Terminals, Micros Linked to System/34, 38

CHICAGO — Protocol Management, a joint venture of Pro Com Sales Corp. and Computer Management Associates, Ltd., has introduced a protocol converter that reportedly allows the interfacing of Ascii terminals and microcomputers to the IBM System/34 or System/38.

The Perle 300/525 protocol converter is said to allow remote devices to appear to the host system as standard IBM 5251 desktop computers. It is attached to a communications adapter on the IBM host through a standard modem or a modem eliminator device.

The converter is provided with either four or eight EIA connections, a vendor spokesman said.

Prices for the converter range from $6,850 to $8,900. More information is available from Protocol Management, Suite 2101, 600 S. Dearborn, Chicago, Ill. 60605.

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Line-Printer Controllers Tie Teletype to DEC CPUs

BARTLETT, Ill. — Neoteric Systems, Inc. has unveiled two line-printer controllers designed to add Teletype Corp.'s 300 line/min printing capabilities to Digital Equipment Corp. LSI-11 and PDP-11 processors.

The LPC16/Q and LPC16/U controllers interface the Teletype Model 40 printer with DEC LSI-11 series (Qbus) and PDP-11 (Unibus) processors. The controllers are identical to the DEC line-printer interfaces, LPV11 and LP11, and are totally transparent to all DEC software, the vendor claimed.

The two mount in the processor's backplane or expansion box. The interface consists of one board and requires no printer modification.

The LPC16/Q costs $742.50 and the LPC16/U, $816.75, Neoteric said from 320 S. Main St., Bartlett, Ill. 60103.

Modem Makes Peripherals Portable

SEATTLE — A line carrier modem that reportedly provides instant portability to computer terminals and printers without the installation of messy and expensive cables is available from Communications Research Corp.

The LCM-100 utilizes existing house, factory or office power wiring to connect terminals and printers to a computer, while transmitting at up to 9,600 bit/sec, the vendor said.

The system reportedly consists of two units: one for the computer and the other for the printer or communications device being used.

The system costs $315. Communications Research is headquartered at 1720 130th Ave. N.E., Bellevue, Wash. 98005.

NCC Corp. Unveils CRT Terminal Featuring Full Graphics Package

STAMFORD, Conn. — National Computer Communications Corp. has unveiled a CRT terminal said to feature Digital Engineering, Inc.'s Retro-Graphics graphics package.

The graphics feature reportedly enables the vendor's Termigraphics CRT terminal to provide full vector-drawing and point-plotting capabilities on a 512- by 250-unit grid. It can overlay alphanumerics on a graph or selectively erase a particular vector. Bar charts, function plots, histograms and other types of graphics can be displayed, the vendor claimed.

Standard features on the Termigraphics terminal include reverse video and reduced intensity, limited editing, a gated-extension port and compatibility with all popular Ascii terminals.

The terminal costs $1,675 from National Computer Communications Corp. at 260 W. Ave., Stamford, Conn. 06094.

Multiplexer Ties LSI-11s, Devices

TORRANCE, Calif. — Carat Computer Corp. has announced the Mighty Mux Model 500 multiplexer for Digital Equipment Corp. LSI-11 processors.

The unit was designed to link LSI-11 processors with a variety of printer and graphics terminals, CRT terminals, modems, floppy disks, line printers, card readers and other devices, the vendor said.

Using direct memory access, the Model 500 reportedly cuts the processor overhead necessary to support peripherals. Each port provides four status and control lines and can be programmed for synchronous or asynchronous communications.

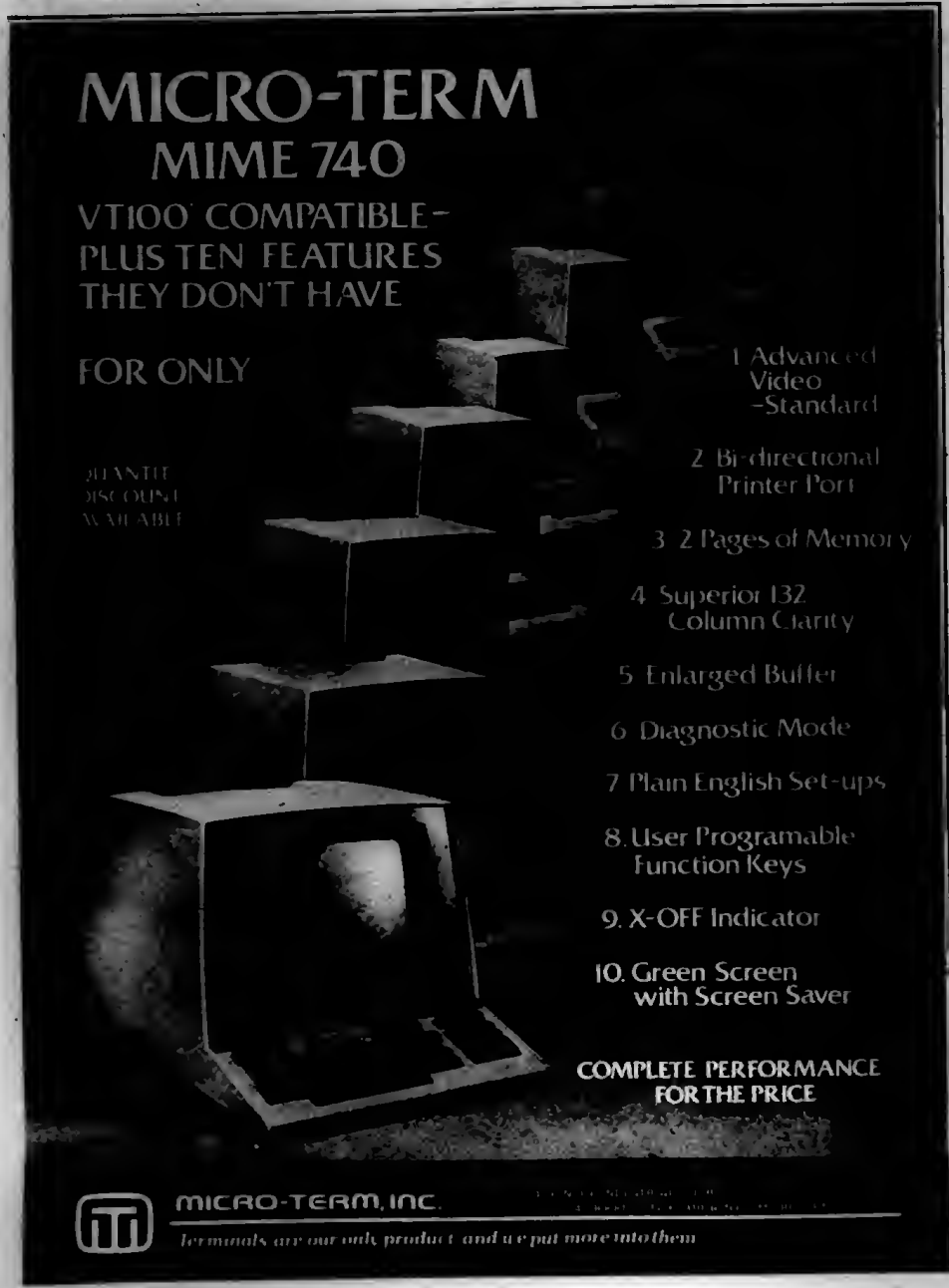
The unit costs $1,848, Carat said from 20775 S. Western Ave., Torrance, Calif. 90501.

Tester Transmits Dual-Mode Messages

CIRCLEVILLE, N.Y. — RVS Electronics, Inc. has introduced a communications tester said to transmit test messages in both RS-232C serial and parallel TTL modes.

The Model 1011A Communications Tester with resident erasable programmable read-only memory (2K or 4K bytes) will transmit up to eight different user-specified messages and languages. Sixteen transmission rates for hookup are standard.

The tester costs $895. RVS can be reached at P.O. Box 87, Circleville, N.Y. 10919.



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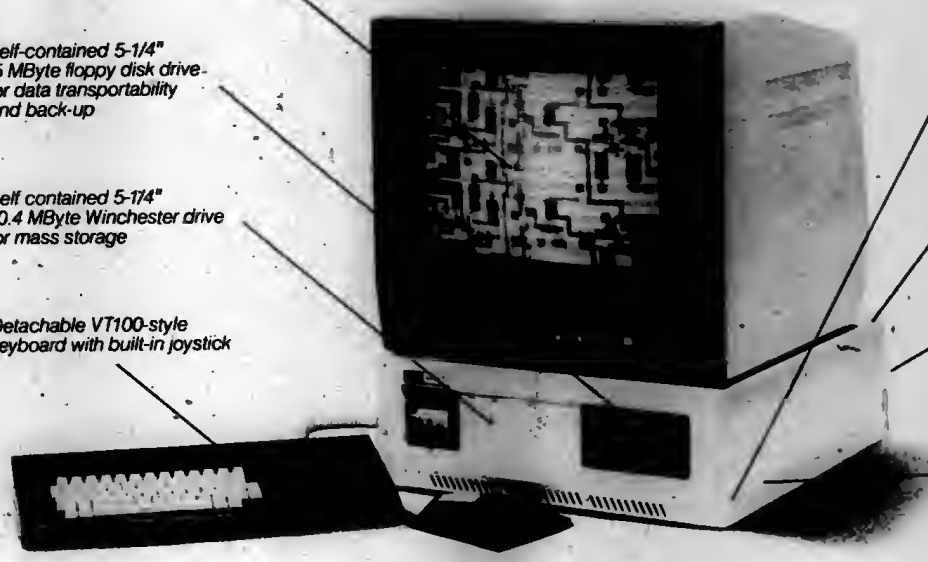

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Howard Anderson, President, The Yankee Group
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Dr. Michael Hammer, Associate Professor, MIT
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Avoid the Pitfalls of Disk Maintenance

By Joseph M. Ludka
Special to CW‡

When removable disks were first introduced as the successors to punched cards and magnetic tape, it was love at first byte.

Disks would do away with lethargic sequential processing. Data could be spread out anywhere across the tracks of a disk and retrieved almost instantly since random-access technology had done away with time-consuming card readers and tape searches. But the love affair did not last long.

The magic of disks began to fade as users were quickly introduced to such insidious problems as read/write errors, track reassignments, data checks and, in some cases, disastrous head crashes. Dirt, dust and invisible contaminants that did not matter with cards and tape became major concerns with high-speed disks.

Questionable Solutions

Problems of any sort usually give birth to a host of companies and snake-oil hucksters willing to sell solutions. This is especially true in the DP industry. The difficulty lies in separating the players who advocate what is truly good for the user from those who push so-called solutions that serve only the "advisor's" needs at the expense of the user.

For instance, if a drive manufacturer wanted his drives to perform optimally, he would insist that every disk pack be perfect in every way. Even the slightest mark on the disk surface would be cause for removal from the system at the expense of the user. This advice is definitely self-serving for the drive supplier.

The same is true for disk manufacturers. If there is a question about a pack's condition and the advisor stands to profit from a recommendation to replace or repair, how fair a judgement is the user likely to get?

Some disk maintenance firms even furnish on-site disk maintenance at marvelously low prices. But they actually use this guise to sell the user new packs or repair "defective" ones. This does not eradicate the problem a user might have in the first place.

At the same time, other maintenance firms will base the number of bad or good packs they discover at a particular installation on the amount of work that is backlogged at the factory. In short, you will give them all the business they can handle at the time. The problem then is to separate the real maintenance firms from the self-serving pretenders.

The first thing to remember is that the performance of a questionable pack cannot be improved simply by looking at it.

(Continued on Page 72)

Study Backs Maintenance Habit

LOWELL, Mass. — Regular disk maintenance will significantly improve system performance, reducing head crashes, error counts and downtime. It will also result in long-term economic savings.

Those are the findings of a 12-month study on disk media maintenance completed early this year by Scopus Corp. The firm is reportedly the nation's first and largest independent magnetic media maintenance organization.

In the study, which covered more than 15,000 computer installations and more than 350,000 disk cartridges and packs, Scopus found computer sites that utilized regular disk maintenance had fewer defective disks removed from their libraries on an annual basis, resulting in improved performance.

The study also found that better performance and fewer defective disks resulted when a media maintenance program was established within six months after a new system or disk was installed.

The installations surveyed included six out of the top 10 financial installations, telephone and related companies, major newspaper chains and a majority of the manufacturers of computer systems. The study measured the effects of a firm's computer disk maintenance on inspection and cleaning on an annual (or less), semiannual and quarterly basis, according to Scopus Vice-President William H. Dwyer.

Based on the number of times serviced during the 12-month period, the number of cartridges and/or packs remaining in service were compared with the number that had to be removed as a result of surface problems.

Among the survey's findings:

- For 50mm cartridges serviced on an annual basis, 6.96% of the cartridges were defective and required removal. However, when maintenance was performed on a semiannual basis, the study found that only 3.40% of the cartridges had to be removed. If maintenance was done on a quarterly basis, the annual rate dropped to 2.72%.
- For 75mm cartridges, maintenance on an annual (or less) basis resulted in an 8.01% defect rate. Cartridges serviced on a semiannual basis clocked in at 3.2%, while those looked at quarterly came in at 3.12%.
- For 50mm disk packs serviced on an annual basis, a defective rate of 14.7% resulted, as compared with a 6.07% for semiannual service and 3.93% for those serviced quarterly.

Scopus also measured the defect rate of new cartridge disk systems. Of 175 new systems surveyed that began media maintenance within six months after installation and continued it on a quarterly basis, the percentage of defective disks requiring removal from the site was 2.05% for the first visit, 1.57% for the second visit and .75% for the third visit. In fact, for all the sites surveyed, the amount of defects average about 1.44% for the entire period.

More information is available from Scopus, P.O. Box 1437, Lowell, Mass. 01853.

Not Yet Available in U.S.

Hitachi Brings Out Supercomputer

NEW YORK — Hitachi, Ltd. has announced a large-scale vector processor reportedly capable of executing up to 630 million floating-point operations per second (Mflops).

Hitachi currently plans to market the system only in Japan, but a company spokesman here said the firm is eyeing the U.S. and other international markets. He could not, however, say when Hitachi will decide whether to market the system internationally.

Called the S-810, the processor comes in two models, the S-810/20 and low-end S-810/10. The S-810/20, whose main memory can range up to 256M bytes, can execute instructions at up to 630 Mflops and is available with a maximum of 32 channels. Channel transmission speed is 96M byte/sec.

The S-810/20 is scheduled to be available in the third quarter of 1983 on a lease-only basis, with rates starting at about $280,000/mo, Hitachi said.

The smaller S-810/10 is rated at 315 Mflops. Like the S-810/20, it is available with up to 32 channels, also operating at 96M byte/sec. Maximum main memory on the 810/10 is 128M bytes.

The S-810/10 is slated for delivery in the third quarter of 1983 on a lease-only basis. Rates will begin at $200,000/mo.

The S-810 series, which Hitachi will reportedly begin marketing in September, uses a control program based on Hitachi's VOS3 operating system. The processors can make use of peripherals designed for Hitachi's M series of processors, but M series software must be converted to operate on the S-810. It is possible, however, to create a multiprocessing environment by linking an S-810 processor with an M series processor, Hitachi said.

Hitachi also announced two extended storage features for the S-810 processor. Extended Storage Type I features a maximum capacity of 512M bytes and a maximum transfer rate of 500M byte/sec. Extended Storage Type II offers a maximum capacity of one gigabyte and a maximum transfer rate of 1,000M byte/sec.

Specialized software available for the system includes 3/HAP (a control program), Fori (a Fortran compiler), Vectizer (a tune-up software package) and Matrix HAP (a matrix operation subroutine package).

Intel Enhances Flexibility Of Fast-3800 Disk Systems

SANTA CLARA, Calif. — Intel Corp. has enhanced the performance and flexibility of its Fast-3800 semiconductor disk system by adding a data streaming option, making it compatible with IBM 3081 and other mainframes offering data streaming as a system capability.

Data streaming is an IBM feature said to permit faster data transfer rates — up to 3M-byte/sec — and increased channel-to-control unit cable lengths of up to 400 feet. Intel's option approximately doubles the Fast-3800's capabilities by delivering nearly twice the current paging rate, an Intel spokesman said. The option also doubles performance-critical nonpaging applications.

Current Fast-3800 systems can be field-upgraded to support the data streaming option. The purchase price is $25,000/controller plus a $5,000 upgrade installation charge.

Additional information on the enhancement can be obtained from Intel at 3065 Bowers Ave., Santa Clara, Calif. 95051.

Xerox Expands Line of Scientific Processors

EL SEGUNDO, Calif. — Xerox Corp. has expanded its series of scientific information processors by unveiling two models: a low-cost artificial intelligence workstation and a high-performance system with up to 2M bytes of main memory and an 8K-byte cache memory.

The Model 1108 and high-end 1132 processors are outgrowths of the firm's now mid-range Model 1100 processor introduced last year. All three systems were demonstrated here last month at the National Conference on Artificial Intelligence.

The 1108 system includes a large-format, high-resoution CRT terminal display; a keyboard; a processor; and a "mouse" pointing device used in system operation. Like the Model 1100, the 1108 processor has 1M byte of main memory that can be expanded up to 1.5M bytes. However, this latest system offers over 50% less disk storage capacity: a 10M-byte Shugart Associates, Inc. disk drive and a 1M-byte floppy disk backup drive.

Model 1132

The high-performance Model 1132 also includes a large-format display, a keyboard and mouse electronic pointer. However, the processor has a main memory capacity of 2M bytes and can be expanded in 2M-byte increments to a total of 8M bytes of main memory. It also includes an 80M-byte Century Data Systems, Inc. disk drive.

The 1132 reportedly has less than a 70 nsec microinstruction cycle time, a memory bandwidth of 530M bits and an 8K-byte cache memory.

All three computers come with Smalltalk-80 and Interlisp-D software — which is an upwardly compatible extension of Interlisp said to be one of the most prevalent computer programming languages used in artificial intelligence research. Both programming language and operating systems were developed by Xerox and are being marketed by Xerox Electro-Optical Systems, headquartered in Pasadena, Calif.

Ethernet Compatibility

The three computers are also compatible with the firm's Ethernet local-area network communications software, the spokesman said.

Prices for the 1108 and 1132, with Interlisp-D software, are $30,000 and $179,000, respectively. The prepaid license fee for Smalltalk-80 is $5,000 for each processor.

To keep the previously introduced Model 1100 competitive in its own line, the firm has also reduced its price with Interlisp-D from $59,000 to $45,000. The 1108 and 1132 processors will be available in selected cities in the U.S. in the second and third quarters of 1983, respectively, the spokesman noted from the firm at 701 S. Aviation Blvd., El Segundo, Calif. 90245.

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Drafting Tool Fits Cadmax

BALTIMORE — Vector Automation, Inc. has announced a drafting package for its Cadmax turnkey computer-aided design and manufacturing system.

The package was designed to take advantage of Vector Automation's high-resolution refresh display, which is a standard component of the Cadmax system, according to the vendor.

The software reportedly is suited for heavy drafting applications using the firm's proprietary 16-bit minicomputer, the vendor said.

Vector's turnkey systems cost from $66,200, the vendor said from the Village of Keys, Baltimore, Md. 21210.

Plug-In Memory Fits Prime 50s

MONTEBELLO, Calif. — IO Devices, Inc. has announced a plug-in memory family for 32-bit Prime Computer, Inc. Series 50 computers.

The memory products reportedly can be plugged into any slots assigned for the Prime E6 or E8 original boards.

The family of plug-in memories includes the 1M-byte IOE8, which costs $14,250; the 512K-byte IOE7, priced at $9,375; and the 256K-byte IOE6, which costs $5,600, according to IO.

IO Devices, Inc. can be reached through P.O. Box 327, Montebello, Calif. 90640.

Disks — Love at First Byte

(Continued from Page 69)

"Soft" errors are frequently caused by contamination. Remove the contamination and you remove the problem. However, no matter how sophisticated and "error-free" disks are, they do need maintenance.

The companies that engage in disk maintenance usually fall into three categories and several subcategories:

- Category 1 — Espouses the philosophy of the 1960s that packs still require no cleaning, but should be inspected regularly to discover any irregularities, contamination buildup, coating deterioration or tolerance failures. This form of upkeep is a corrective rather than preventive form of maintenance.

Also in this case, the user is asked to believe that the inspector can actually "see" contamination buildup of 20 to 25 microinches and predict head crashes.

- Category 2 — Comparable to Category 1, except that the firms in this group include positive action in their attempts to remove contaminants from the disk. These firms employ a dry wipe of the disk's surface and/or a spritz of the surface with compressed air.
- Category 3 — Combines pack inspection with some form of wet cleaning, including a 91% isopropyl alcohol solution applied manually or semimechanically to the disk's surface.

They also use brushes and wet cleaners specially formulated to dissolve contaminants. The brushes serve to disperse the chemical solvent rather than actually scrub the disk. Contaminants are emulsified and lifted from the disk's surface, and the disk is dried with heated air.

These varying methods for maintaining disk packs give the user plenty to ponder while searching for a proper, professional means to achieve optimum disk performance.

User Guidelines

The following guidelines might help the user in this search:

- Deal with professionals in disk maintenance, firms that make disk maintenance their main business.
- Don't deal with firms that represent hundreds of products.
- Check and approve the firm's credentials.
- Ask for recommendations from satisfied customers and follow up on them.
- Consider how long the firm has been in business.
- Make certain the firm's equipment is capable of checking and cleaning packs within a manufacturer's tolerances.
- Make sure the firm is aware of your equipment's tolerances.
- Ask for and carefully observe a demonstration of the service.
- Question any statement or action that does not seem right. Insist on a satisfactory explanation.
- If possible, have the firm service a known problem pack and test it afterward for results.
- Most importantly, use common sense in analyzing statements made and materials submitted.

If anything seems illogical or leaves you unsatisfied and cannot be corrected, start to eliminate quasi-maintenance firms until you arrive at the one or two in which you have confidence.

Ludke is president of Randomex, Inc., a manufacturer of disk maintenance equipment and systems and provider of on-site disk maintenance in Signal Hill, Calif.

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Matrix Printer, Dbase II Added To Victor 9000

CHICAGO — Victor Business Products, Inc. has announced two enhancements for its 16-bit Victor 9000 desktop computer: support of Ashton-Tate's Dbase II data base management software package and a dot matrix printer that can print in both data- and letter-quality modes.

The Victor-version Dbase II is a relational data base management system that allows Victor 9000 system users to access files created under a variety of the firm's application programs, make changes to those files and make them available for additional processing under the original program.

The software runs under Digital Research, Inc.'s CP/M-86 operating system and can handle a maximum of 65,000 record/file and 1,000 char./record, a spokesman said. The package costs $695 and is available now.

The Model 6030 printer operates at speeds up to 400 char./sec and has two software-selectable writing modes, one for data-quality production and a "near-letter quality" mode for word processing chores. The unit operates at a maximum 100 char./sec in its WP mode, the apokesman explained.

Features of the printer include: controls for top-of-form, line feed and on-line/local; a continuous forms tractor-feed mechanism; and a variety of language sets, including British English, Danish and German.

The Model 6030 printer costs $3,200 with deliveries scheduled in the fourth quarter of this year. Victor Business Products, a subsidiary of Kidde, Inc., is located at 3900 N. Rockwell St., Chicago, Ill. 60618.

First Users of System/38 Model 7 Report Programmer Productivity Up

TUSCALOOSA, Ala. — More programming applications and increased programmer productivity. Those are two of the benefits reported by the first users of IBM's System/38 Model 7 minicomputer, an upgrade of the Model S that reportedly doubles the original maximum main storage and performance.

The Druid City Hospital Regional Medical Center in Tuscaloosa, Ala., upgraded its System/38 Model 5 computer in mid-June to expand the system's operation to other areas in the hospital's operations. The 550-bed hospital located here serves a community of more than 230,000.

The hospital originally expanded the computer to add more applications and to add interactive CRT terminals. Today, the system has about 50 terminals and 50 printers scattered throughout the hospital and handles about 25 to 30 transactions related to patient care each day, Leslie H. Smith Jr., the hospital's associate administrator, said.

Response Times

"When you consider that we admitted almost 24,000 patients last year, you can understand why we were looking forward to the additional power and speed the Model 7 would give us," he stated. "The day after the Model 7 was brought up, we were getting response times up to two-thirds faster," according to Smith.

The Model 7's increased performance reportedly allowed the hospital to add more clinical and diagnostic applications that were developed by the site's five programmers. One recently added application involves calculating the components of intravenous solutions for high-risk babies who are unable to eat or digest food, Smith explained. The hospital has an average of 25 high-risk babies in the nursery on any given day.

The computer performs these solution calculations in about a second. Previously, it took a pharmacist about 15 minutes to make these calculations by hand or with a calculator, he claimed.

The hospital has one other System/38 Model 5, which it intends to upgrade to a Model 7 in the near future.

Computerization Not New

Computerization is not new to the Druid City hospital. The organization began using an IBM computer — a System/3 Model 10 — about a decade ago. An IBM 1800 system was added later for patient care applications. In fact, Druid City was the first hosptial in the country to develop a computer-based evaluation system of patient medical care.

South-Western Publishing Co. of Cincinnati was a test site for the IBM System/38 Model 7 computer. The 79-year-old textbook publisher is one of the country's leading producers of educational materials for secondary schools and colleges.

The firm uses the system to handle all its financial chores, as well as a direct mail operation that manages the names of more than 250,000 teachers across the country.

South-Western installed a System/38 in February 1981 to replace an IBM System/3 Model 15D processor. The company's aim was to increase the applications level and beef up programmer productivity.

"The bottom line is the ability to get programs up and running in about 30% of the time it used to take," Elmer Kaising, the company's vice-president for finance, said.

More Tailored Programs

In the past, the firm used the System 3 to develop programs that could be used by a large number of users. The reason being that it took a great deal of time to develop programs and widespread use was the only way to justify their expense. With the System/38 and its increased performance, however, more tailored programs can be developed and used by smaller groups of employees.

Response times on the computer have also improved dramatically, Kaising noted. For example, with the old system the response time varied from 5 sec to 20 sec. With the new computer, there is hardly ever a wait more than two seconds.

The South-Western system includes 50 terminals, one system printer and seven workstation printers. The firm has been testing the System/38 Model 7 since December. The system was announced March 24 and began customer shipments in mid-June.

Digitizer Out for Apple, IBM Micros

VERNON, Conn. — A spatial digitizer for Apple Computers, Inc. and IBM Personal Computer microcomputers that is said to allow users to record the x, y and z coordinates of any three-dimensional object has been introduced by Micro Control Systems, Inc.

The Space Tablet consists of a 13.5 in. by 16 in. clear lucite tablet on which is mounted a precision-machined aluminum and delrin arm. Users input information by tracing the point of the arm across a three-dimensional object. With one motion of the tablet arm pointer, a user can reportedly pull points and lines to new locations in three-dimensional space, much like the actions of a large-scale computer-aided design system.

Applications for the device include art, architecture, mechanical engineering, chemistry, computer peripheral and medical research, a spokesman said.

The Space Tablet can be utilized as either a two- or three-dimensional digitizer. In addition, a professional version of the unit provides an added axis of rotation, or fourth degree of freedom.

The unit includes the firm's Space Graphics software or the Complete Graphics System II, available from Penguin Software.

The hardware and software for the digitizer is priced less than $600 from Micro Control Systems, 143 Tunnel Road, Vernon, Conn. 06066.

Super Cadet Gets Cache

CHATSWORTH, Calif. — Integrated Business Computers, Inc. has announced a cache disk memory for the firm's Super Cadet computer system.

The cache disk memory consists of 256K bytes of 150-nsec memory using 64K-byte chips. Using a block transfer, the processor's Zilog, Inc. Z80B microprocessor can transfer a typical 5K-byte program overlay into main memory in under 18 msecs.

The memory is available on a 4-in. square printed-circuit board and costs $1,875, Integrated Business Computers said from 21592 Marilla St., Chatsworth, Calif. 91311.

Best Energy Introduces Power Protection Systems

NECEDAH, Wis. — Best Energy Systems, Inc. has introduced two power protection systems for minicomputers, scanners and point-of-sale terminals: one was designed to provide power in the event of losses caused by brownouts and blackouts; the other provides the same protection and also guards against line spikes, sags, surges and noise as well.

The Outage Protection System (OPS) Models I and II supply backup power within milliseconds of a blackout or brownout, a spokesman claimed. In addition, they are said to be easier to maintain than uninterruptable power supplies or engine generator systems.

Both the OPS I and II are available in 14 power sizes ranging from 500 to 12,000 watts. They are also offered in a compact B-Series and in an easily-serviceable and modular M-Series. Options include solid-state switching relays, audible alarms and special equipment enclosures.

Prices for the systems range from $1,500 to $14,500, depending on the type of computers, equipment and applications involved. Information about the OPS systems is available from the firm at P.O. Box 280, Necedah, Wis. 54646, or its national marketing organization at Suite 47, 241 Frontage Road, Burr Ridge, Ill. 60521.

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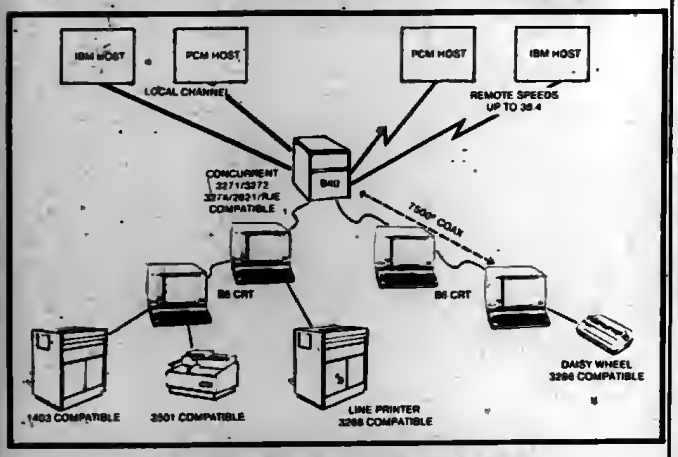

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Printer Fits HP Processors

PALO ALTO, Calif. — Hewlett-Packard Co. has announced a 600 line/min printer, the HP 2611A, for use with HP 1000 and HP 3000 processors.

The unit has a chain-train printer with 132-col printing, a 12-channel vertical format unit, a long line interface (up to 500 feet) and an enclosed stand included as standard features.

The HP 2611A features dual-power paper tractors, above and below feed and a paper puller said to reduce jams, the vendor said.

The unit costs $18,110. A 96-Ascii-char. set option costs $1,420. More information is available from the Inquiries Manager at 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Controller Takes IBM-Type Tapes

SAN DIEGO — Innovative Data Technology, Inc. has announced the Series 2600, a tape controller/formatter for systems using ½-in. IBM-type magnetic tapes.

The unit reportedly features compatibility with a variety of tape transports operating at up to 75 in./sec. The unit is set in a rack-mountable cabinet, which typically contains two printed-circuit cards; an industry-compatible magnetic tape formatter (for unformatted tape transports); a microprocessor-based intelligent controller; and a variety of "personality" modules, which allow the unit to interface with various standard buses, including RS-232C, IEEE 488 and an 8-bit parallel I/O bus.

Controller/formatters are priced from $2,495, the vendor said from 4060 Morena Blvd., San Diego, Calif. 92117.

Test Unit Fits Apple Drives

MICHIGAN CITY, Ind. — A disk drive tester/exerciser for Apple Computer, Inc. Apple II and Apple III drives is available from Teaco, Inc.

The Appli-Cator 4023 tester/exerciser is said to handle all circuits including power, stepper (full- and half-track), read, write, erase, write protect, drive select, read enable and motor enable.

The unit costs $650. Teaco can be reached through P.O. Box E, Michigan City, Ind. 46360.

Power Supply Has Off-Line Switchers

CANTON, Mass. — A 60W multiple-output switching power supply has been announced by Power General, Inc.

The Series 3060 power supplies are said to be true off-the-line switchers with up to four output voltages on a single printed-circuit board, designed to operate a number of microprocessor-based systems.

The Models 3060-1 and 3060-2 cost $135 each from Power General, 152 Will Drive, P.O. Box 189, Canton, Mass. 02021.

Plug-in Board Helps To Provide Virtual System

BERKELEY, Calif. — Virtual Microsystems, Inc. has released a microprocessor-based device said to work with the firm's "The Bridge" virtual microcomputer system to provide a virtual operating system for Digital Equipment Corp. VAX, PDP-11 or LSI-11 computer systems. The plug-in board works with Digital Research, Inc.'s CP/M operating system.

The DEC Unibus version of z-Board features four Zilog, Inc. Z80 microprocessors and 256K bytes of memory, along with a bit-slice state machine that handles the bus interface. The similar DEC Q-Bus version may be populated with one to four Z80s.

The Bridge costs between $1,000 and $3,500; the Unibus z-Board costs $4,000; and the Q-Bus z-Board costs between $1,250 and $3,500, depending on the number of microcomputers, a spokesman said from Suite 720, 2150 Shattuck Ave., Berkeley, Calif. 94704.

Osborne 1 Users Share Disk Net

SAN JOSE, Calif. — Corvus Systems, Inc. has announced that Osborne Computer Corp.'s Osborne 1 portable computer can now take advantage of the firm's shared-disk network, providing shared mass storage capabilities. The disk networking system is available in single-disk capacities up to 20M bytes.

The announcement also means that with the Corvus Multiplexer local-area network, Osborne users reportedly can share the Corvus disk system as well as printers and other peripherals.

Prices of 6M-, 11M- and 20M-byte Winchester disk mass storage systems for the Osborne 1 start at $3,195 from Corvus at 2029 O'Toole Ave., San Jose, Calif. 95131.

Multiline Makes Control System

INDIANAPOLIS — A microcomputer-based, maintenance department revenue and expense control system has been announced by Multiline Business Systems Corp.

Advanced Maintenance Control (AMC) comprises a Televideo Computer Systems, Inc. TS-802H microcomputer for single users or OSM Corp. Zeus microcomputer for multiple users, CRT workstations, hard-disk storage and a 120- to 600 char./sec printer.

Software modules include file maintenance, service call handling; invoice generation, monthly statements and collections and financial and costing reporting system, according to the vendor.

The basic price for the system is $18,995, including hardware and all modules, a spokesman said from 2441 Production Drive, Indianapolis, Ind. 46241.

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perfectly good buy for our competition, but we'd like to introduce the new ADM 22—our latest, low-end smart terminal.

Over the years, we've learned that everyone in the industry looks forward to our new product intros. Everyone, that is, except our competition. And the ADM 22 is no exception. Oh, how they wish they could match its incredible price/performance figures.

How they fear the competitive [illegible] us a[illegible] or [illegible] 774-1010 and ask for more information about the ADM 22.

How they wish their service programs could cover 3000 cities nationwide, offer extended warranties, on-site service, and Express Depots™ for convenient walk-in service.

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Coming up in *Computerworld OA*

Selling Office Automation to Your Organization

The next issue of *Computerworld OA* will focus on selling office automation within an organization. This special report will feature the human angle of office automation and highlight the strategies of selling the concept of OA to top management and end-users in an organization. You'll see articles on implementation techniques, feasability studies, human interface, ergonomics and productivity.

And, of course, you'll see several articles on current happenings in all aspects of OA.

There will be bonus distribution of this issue to attendees of the Info '82 Show in New York this October.

The issue date is September 29th.

For more details on *Computerworld OA* and the people who read it, just contact your local *Computerworld* representative, or call Bob Ziegel, Vice President at (617) 879-0700 for all the information.

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WPOE Holds Annual Meet Oct. 26-28

SAN JOSE, Calif. — The Word Processing & Office Technology Exposition (WPOE) will hold its annual Word Processing & Office Technology Conference in conjunction with the WPOE Trade Show Oct. 26-28 at the San Jose Convention Center here.

The conference reportedly will feature more than 40 office automation experts including keynote speaker John Connell, executive director of the Pasadena, Calif.-based Office Technology Research Group.

The conference costs $70/day or $175 for all three days; there is also a $15 fee for each tutorial session attended. The WPOE is based in Suite 1014, 491 Macara Ave., Sunnyvale, Calif. 94086.

Lexicom Upgrade Out For Apple II

LINCOLN, Mass. — Micro-Sparc, Inc. has released an upgraded version of Lexicom, its word processing utility for the Apple Computer, Inc. Apple II. The upgraded version reportedly allows nearly universal transfer of WP files.

Lexicom II allows the user to convert Supertext files to Applewriter I format, Applewriter I files to Supertext format, Supertext or Applewriter 1 files to standard Apple text files and standard text files to Applewriter 1 or Supertext format.

Lexicom II requires Applesoft and runs on a 48K-byte Apple II with DOS 3.3.

The WP software costs $39.95 from Apple dealers or $39.95 plus $1.50 for shipping and handling from Micro-Sparc.

More information is available from Micro-Sparc's Systems Division, Department P, Box 325, Lincoln, Mass. 01773.

Execs See DPers Running, Not Dominating OA Future

By Robert Batt
CW West Coast Bureau

DALLAS — Management information systems (MIS) managers will retain control of the office automation revolution while giving up some of their traditional powers.

This was the consensus of senior managers in three major Texas-based corporations in interviews conducted here recently.

Larry Spelhaug, manager of marketing services at Xerox Corp.'s Office Products Division, said it is clear that data processing management will run the process of increasingly automated offices. But, he warned, "As personal computers and local-area networks bring more and more automation to the end user, the degree of control traditionally exercised by the DP manager will diminish."

The role of the DP department, he suggested, will be to ensure compatibility of computer purchases and provide even closer working relationships between MIS and end-user departments.

"Who actually manages the day-to-day activities of the automated office will vary from company to company, but the central focus of management will remain in the DP shop," Spelhaug commented. "MIS, because of its experience and expertise will have the legitimate right to this role," he added.

While claiming that many Xerox users had amicably resolved potential conflicts within their corporations resulting from distrubuted processing, Spelhaug also acknowledged that others have been engaged in "open warfare" on the issue with MIS departments and end-user departments refusing to talk to each other.

(Continued on Page 78)

Exec Explains Drop In Xerox Profits

DALLAS — Following Xerox Corp.'s latest quarterly report in which the company posted its first-ever decrease in profits, a senior manager at Xerox Corp. has responded to industry criticisms that the enterprise is badly managed.

Larry Spelhaug, manager of marketing services, Office Products Division, said it was true that the company had been caught out by the rapid rate of technological change in office automation. But, he added, steps are now being taken to remedy the problem.

"The business we are in is changing fast, and for a time, we were not changing fast enough," Spelhaug admitted. "The systems side of the business has become more prevalent, and for a time the company didn't understand the fast changing market it was in."

To remedy that deficiency, he said, Xerox has brought senior managers from companies such as IBM and Burroughs Corp. into the corporation.

"We are now seeing a more systems-oriented senior management team, and through the approaches they are taking, we believe we can reverse the slowing down of revenue and profit increases that have been with the company over the past 15 years."

The Xerox manager said the corporation was also concentrating on strategic investments in areas such as office systems, electronic printing and graphics as a way of boosting growth and productivity.

The recent split of the company's office products and office systems divisions was a reflection of a need for a better trained sales and marketing network, he conceded.

The overall atrategy, Spelhaug concluded, is to make the systems business as large a part of the company's operations in the late 1980s as its copier business is today.

Televideo Unveils Printer

SUNNYVALE, Calif. — Televideo Systems, Inc. has announced Telewriter, a letter-quality printer for the firm'a single and multiuser Digital Research, Inc. CP/M-based small business desktop processors.

The unit reportedly has a 35 char./sec print speed and comes with all the necessary hardware to attach the unit to a Televideo RS-232 serial port. It was designed for desktop use in any small business or office environment. The printer is manufactured for Televideo by Nippon Electric Co.

The unit costs $2,195. Televideo is at 1170 Morse Ave., Sunnyvale, Calif. 94086.

Hospital Looks Into Paperless Future With WP Package

LOS ANGELES — In an effort to become a paperless hospital, the Jules Stein Eye Institute here obtained a medical software system and a multiuser word processing package.

The institute, which is part of the University of California at Los Angeles (UCLA) Medical Center, is an internatioonally recognized center for research, teaching and the treatment of eye diseases. Hundreds of scientific reports covering basic biomedical science and clinical ophthalmology have been published there.

David Werneburg, director of data sciences at the institute, states "We are moving toward a 'paperless' hospital, not only to reduce overhead costs, but to provide better support for our medical staff." Werneburg came to the Jules Stein Eye Institute about two years ago to direct the development of a DP facility.

His goal was to design a system that would go far beyond the traditional areas of patient records and accounting and provide data. His intent was to design a system that would allow physicians, researchers and supporting staff to have direct access to the system so that the data base could be utilized effectively. The system had to "come up" without extensive user training and rethinking of the traditional methods of data gathering and presentation. In short, it had to be compatible with existing procedures.

Creating a 'Document'

Werneburg took the design approach of using Costar (Computer Stored Ambulatory Record), a powerful medically oriented software system, and Digital Equipment Corp.'s VAX-11 computer hardware. He then considered how he could best give users access to the computer system. Werneburg concluded that the best way was to have the users feel that they were creating a "document" — an ideal use of word processing.

To satisfy his requirements, he selected a multiuser word processing software package called CT*OS from Compu-Tome, Inc., Pasadena, Calif. An important feature of CT*OS is that it is compatible with the VAX-11 computer hardware and Costar software.

With CT*OS, up to 90 users can have their own CRT screen and still not slow down the operation of the system.

The hardware configuration includes a VAX-11/780, running under VMS, 3M bytes of main memory, two RM05 disks, each with 300M-bytes capacity, a TU 58 high-speed tape drive, and when fully populated, 90 VT100-type terminals.

Some typical uses of CT*OS at the institute are for preparation of operating room reports, direct entry by physicians of data developed during examinations, researcher data acquisition and direct entry by administrative and clerical personnel of the many reports required for providers. The institute is a strong teaching hospital, with heavy concentration on editorial work for scientific books and papers. Voluminous numbers of research papers and

(Continued on Page 78)

DPers Seen Running, Not Ruling, OA Future

(Continued from Page 77)

Charles Boyd, manager of business and product management at Texas Instruments, inc.'s Data Systems Group in Austin, Texas, argued the rapid growth of local-area networks will result in MIS managers exercising a strong influence over end users while giving up some of the control characteristic of DP departments today.

"As office automation proceeds, MIS will be the focal point of activity," he noted. "It will be the MIS department that will select the preferred vendor options." Local-area networks will impose a structure of communications on an organization. DP managers will have the major say in what interfaces will be employed, he added, saying that as local nets develop, user options will actually decline in the face of the need to maintain compatibility.

"It is the MIS departments that will make the initial selections of vendor equipment," he said. "They will set up the vendor list and maintain responsibility for data base integrity. As such, they will put limitstions on users' choices."

Complexity Increased

At Harris Corp. based here, Neal Dempsey, vice-president of marketing, Information Terminals Group, maintained that purchasing decisions were now much more complex with the advent of office automation. A decision to be effectively implemented, he maintained, must gain the commitment of senior executive management, divisional managers and end users as well as the MIS department. "As a vendor, when you go to talk to users you must have everyone in the loop involved. If one element in the loop is missing, the MIS department will not be able to convince the other departments of the need for integrated systems," Dempsey explained.

Harris Corp.'s strategy calls for each decision-making level to be consulted three times during the course of a purchase negotiation in order to ensure overall company commitment to the project.

Looking at future market trends in office automation, Xerox's Spelhaug said industries that are capital-rich will be the ones that will continue at the forefront of office integration. Companies that were used to making heavy capital investments, such as the big oil corporations, were among the first to get involved in the new technology. They are now being closely followed by banking, finance and insurance industries, another sector rich in cash, he said.

"A new phenomenon we have been seeing of late, however, is that more of the troubled industries facing a cash crisis are turning to OA as a means of increasing productivity," Spelhaug said. "For example in the automobile industry, companies such as Ford Motor [Co.] and General Motors [Corp.] are investing a tremendous amount in integrated office equipment as they try to get their costs back in line with the Japanese."

Spelhaug claimed that practically all 180 employees in the Environmental Assurance Division of General Motors have an executive workstation on their desks.

Spelhaug concluded that the next major segment of the economy to be automated will be the heavy paper users such as the legal profession, brokerage houses and government. According to Spelhaug, the largest single installation of Xerox's Ethernet local net using its Star executive workstations is within the Department of Defense, with 14 local-area networks installed at one navy base.

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- Database machines
- Personal computers invading the corporate environment
- Graphics
- Lasers

And you'll get a great story on the Epcot (Experimental Prototype Community of Tomorrow) Center — the new amusement park opening in September with computer technology by Sperry Univac. This is computer technology that will affect the community of tomorrow.

If you sell to Vice Presidents, Directors, DP Managers and other MIS professionals, here's where you'll find your buyers this October 27th. *Computerworld Extra!* will be read by more than half-a-million computer-involved readers including 116,988 paid subscribers, (ABC 12/31/81) and 423,720 pass-along readers (Becker Research Corporation).

CW Extra! advertising close is September 17 and we'll be glad to give you more advertising information — as well as complete details on our subscribers and readers. Just contact your local *Computerworld* sales office or call Don Fagan, Vice President Sales, at (800) 343-6474. In Massachusetts call (617) 879-0700.

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Hospital Sees Paperless Future

(Continued from Page 77)

books are currently in preparation and these are all easily handled by CT*OS.

Physicians and researchers were able to begin useful work with the system merely by reading the manual and without formal instruction. This minimized the training time commitment for the DP staff, which is small and very busy. The key is a user-friendly system of logically organized menu screens in which the user selects, step-by-step, what he wants to do (for example: create a document, print the document, edit the document).

Werneburg feels that the Institute's DP system will provide a great improvement in data integrity for clinical research, such as scanning all patient records and identifing all glaucoma patients of a given age, group, sex and occupation; accurate case management; follow-ups; and also, improvement in legal liability protection, due to well-established due diligence.

Here the problem of tracking patients for follow-up examinations, treatment or lab reports, which demand response, is very effectively managed by having the system periodically scan the patient data base and display with emphasis cues if critical items requiring attention.

Werneburg's installation of the VAX/CT*OS DP system will enable the institute to reach its goal of being one of the first major hospitals in the country to be paperless, a goal it expects to reach in three years.

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TUESDAY—SEPTEMBER 21

1. *Keynote Address*—The Amazing Growth of The Software Industry in the 80's. 10:00 AM
Lawrence J. Schoenberg; ADAPSO Chairman, CEO, AGS Computers, Inc.
The packaged software industry, growing at a phenomenal 25-35% annual rate, will be *the major service industry* in the 80's. Mr. Schoenberg will analyze new software techniques and directions and offer insights into future software trends and their impact on you and your company.

2. Selecting Micro Software 2:00 PM
Burton Grad; Chairman, Heights Information Technology Services, Inc.
Burton Grad (President of the Software industry Association ADAPSO) will show you, in detail, the various micro software selection processes that a DP manager or end-user must pursue.

3. Computers in Manufacturing 2:00 PM
Oliver Wight, Inc.
New technologies, systems and equipment emerge almost daily (CAD/CAM, Flexible Manufacturing, Robotics, Kanban, etc.) as the manufacturing and DP disciplines continue their rush toward total integration and interaction. If you have, or plan to have, a computers in manufacturing program, don't miss this session (also note Session 5).

4. All You Ever Wanted to Know About Software Ratings... 2:00 PM
Chairperson: Julie Johnston, Dir. Research and Statistics, ADAPSO
This panel presentation (including representatives from software rating companies) will take a hard look at the criteria used to rate software packages. The pros and cons of rating systems will be discussed and debated.

5. Manufacturing Software Users Panel 3:15 PM
Chairperson: Mike Sumwalt, DP Manager, United Pumps
Panelists: Mike Saltz, Dir. of Information Services, Boston & Maine Corp.
Jim Crowley, Mfg. Systems Consultant, National Semiconductor
This "real-world" session by experienced users will highlight the implementation of manufacturing control systems from the MIS perspective. How to determine what you *really* want from a software package.

6. Software and Office Automation 3:15 PM
Chairperson: Carol Tomme Thiel, *Infosystems*
The automated office will be the catalyst for massive changes in the politics, style, and techniques of information dissemination. Data processing, telecommunications, and word processing will have to be fully integrated in order to provide voice, text and data services.

7. "One-Stop" Financial/Banking Services 3:15 PM
Ms. Marjorie B. Greene, V.P./Mgr., Chicago Operations, PACTEL, Inc.
Financial institutions in the future will rely increasingly on the provision of "one-stop" financial services which will include an entire range of information products.

WEDNESDAY—SEPTEMBER 22

8. Micro Software for Business 9:00 AM
Chairperson: Jerome L. Dreyer, President ADAPSO
Micro software for business has grown dramatically in quality, compatibility, and availability. This panel of business micro users will analyze what now is on the market, what packages have worked well for them, and what the future for this technology might be.

9. Breaking The Programming Bottleneck (Part I) 9:00 AM
Chairperson: Donald Sundeen, Pres., Applications Software, Inc.
The programming bottleneck can delay and/or kill new projects, stymie new applications for existing projects, and destroy avenues of communication and morale between DP and corporate. Packaged software can break through this bottleneck, solving your applications problems, and freeing-up your programming staff.

10. Managing the Total Hardware/Software System 9:00 AM
Douglas C. Jerger, V.P., Appl. SW Div., University Computing Co.
Douglas Jerger's discussion will include package capabilities such as workstation control, tale prompting, automatic scheduling, workload balancing, forecasting, history reporting and performance analysis.

11. Advanced Software Technology for Financial Modeling & Business Planning 10:00 AM
Chairperson: Ron Repeats, Mgr. Planning Services, Management Decision Systems, Inc.
Executives at major corporations are taking advantage of vast information resources in order to make better, more well-informed decisions. This session will review software alternatives.

12. Breaking The Programming Bottleneck (Part II) 10:00 AM
Chairperson: Donald Sundeen, Pres., Applications Software, Inc.
The programming bottleneck can delay and/or kill new projects, stymie new applications for existing projects, and destroy avenues of communication and morale between DP and corporate (See Session 9.)

13. Business Graphics Software Today 10:00 AM
Chairperson: Arlen J. Knudsen, Dir. of Communications Rapidata Div., National Data Corp.
Lively panel discussion of business graphics software with a look at graphics applications in the DP environment. You'll learn how you can apply it with benefits to your company.

14. *Luncheon Speaker*—What Programmer Shortage? NOON
David Eskra; Pres., Panaophic Systems, Inc.
David Eskra will show you how packaged software can overcome your applications backlog and put you on the road to productivity and profits.

THURSDAY—SEPTEMBER 23

15. *Industry Address*—Where We Go From Here 9:00 AM
John J. Cullinane, President & Chairman of the Board Cullinane Database Systems, Inc.
One of the true pioneers, and most well-respected leaders in packaged software, John Cullinane will bring you up-to-date on the industry.

16. Computer Capacity Management 10:00 AM
Chairperson: David E. Vincent; General Manager, Institute for Software Engineering
A user-oriented panel discussion covering capacity management techniques, values, implementation, justification, and integration with overall corporate goals. A study in the methods of need determination, means of acquisition, system justification and overall control of software and systems.

17. Selecting Systems Software 10:00 AM
A. David Tory; Vice President, Computer Associates, Inc.
This session will review the proven processes by which an end-user can identify his needs for systems software.

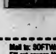
18. Software Conversion—How To Protect Your Investment 10:00 AM
Martin H. Tillinger; PhD, President, MHT Services, Inc.
Dr. Tillinger will explore the available methods of converting applications software to operate successfully in new hardware/software environments. The use of software for a cost-effective conversion will be discussed.

19. Micros as Part of an Overall Business System 11:15 AM
David E. Gold, President, David E. Gold Co.
An overview of the important role of micro computers and micro software in today's business environment. What they do or can do, how they do it, and how they can be profitably implemented into your company.

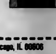
20. You Can't Program People 11:15 AM
Arnold E. "Arnie" Keller, Group Publisher, *Infosystems*
The users are the most important asset in any successful information processing system. How we communicate with them ... and explain the "mysteries" of software...is a key factor.

21. User-Friendly Software Is Here Now 11:15 AM
Dr. Larry Harris; President, Artificial Intelligence Corp.
Artificial intelligence is one area of computer usage where great strides are being made. Dr. Harris will discuss one system which imposes no requirements for structure, syntax, punctuation, definitions or key computer words... and requires no special training or knowledge of computer codes.

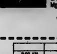
Hear These Industry Leaders:



LAWRENCE J. SCHOENBERG
ADAPSO Chairman
Chairman, AGS Computers, Inc.
Schoenberg began his DP industry career as a member of IBM's programming research group. He has been associated with Litton Industries, Computer Sciences Corp.



DAVID J. ESKRA
President, Panaophic Systems, Inc.
Eskra's 17-year career in the DP industry includes being president of Cogna Systems Corp.; management consultant for Arthur Andersen & Co., Chicago; and management positions with RCA and ITT Data Services.



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A graduate of Boston's Northeastern University, Cullinane is a member of the Board of Directors of the Massachusetts High Technology Council, CAMEX, Inc.; SofTech, Inc., and Essex Investment Mgmt. Co., Inc.

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- ☐ Q Hewlett-Packard
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STSC Acquired at Opportune Time

Daniel Dyer

By Marcia Blumenthal
CW Staff

ROCKVILLE, Md. — The completion of the acquisition of STSC, Inc. by Continental Telecom, Inc. last week came at a time when STSC, immersed in a period of product development, has been feeling the pressure of growth on its bottom line.

Founded in 1969 by Daniel Dyer, now the firm's president and chief executive officer, STSC specializes in application development software based on the APL language. Until 1978, when it went public, STSC concentrated its efforts on building a time-sharing network for its applications, but also began expanding into packaged software products and adapting its APL*Plus system for other vendors' products, such as Digital Equipment Corp. processors and Radio Shack's TRS-80 Model III. In addition, the company recently announced its Long Range Planning System [CW, Aug. 23].

This proliferation of products into new market areas, plus a spotty economy, has taken a toll on the company's revenue growth and profitability, Dyer explained in an interview just prior to the firm's press conference on Sept. 2 in Washington, D.C., announcing the approval of the final merger arrangements. For its latest fiscal year,

(Continued on Page 82)

Peripherals Growth Slips

CDC Concludes Earnings Gain Unrealistic

By Marcia Blumenthal
CW Staff

NEW YORK — The continuing downturn in its OEM peripherals business has caused Control Data Corp. to conclude that "an earnings gain this year is no longer the most realistic expectation and we may have to settle for profits somewhat below last year."

Speaking at a meeting of the New York Society of Security Analysts, Inc. late last month, Marvin G. Rogers, CDC's executive vice-president and chief financial officer, also noted that the peripherals business, which has been growing at more than 30% annually for the past few years, slipped to a growth of about 13% this year.

Sales of peripheral devices make up about one-third of CDC's total revenue, with OEM sales of 14-in. Winchester disk drives comprising a large portion of the peripherals business. The firm sees a good market for its line of microcomputer peripherals, but Rogers pointed out the firm would not obtain the share of the market it has with its present product line.

Despite a downturn in its peripherals business, Robert M. Price, CDC's president and chief operating officer, told analysts the company expected its service business to more than double during the next five years as the company increases the effectiveness of its service bureau network.

Besides its peripherals business, CDC's information services offerings bring in about 28% of revenues and its systems sales account for 10% of revenues with remaining revenues coming from its financial services arm.

Price announced that the firm, which celebrated its 25th anniversary in July, is actively pursuing the development of a supermini, which would be the first system to utilize the company's very large-scale integration technology. Upon subsequent questioning by analysts, Price declined to reveal when such a system would be ready. He did, however, say the supermini would be compatible with the company's Cyber 170/800 series introduced in April and would not represent a new market for the firm, but rather a means of enhancing the markets for the 800 series. Price said some 35 of the 800 units are currently installed.

On a lighter note, rebutting a remark during a presentation by Cray Research, Inc. earlier this year that it would "knock the socks" off CDC in the supercomputer area, Price said Cray was "free to say anything they want. This year we've won more [contracts] than we've lost and let the future speak for itself." Price said the Cyber 205 supercomputer is making a positive contribution to the company's bottom line, with eight systems to be installed by year's end. In upcoming years, CDC expects to install 10 to 12 of the 205s every year.

Although the company has been experiencing squeezed profits recently, Price reported the company has limited active layoffs to less than one-half of 1% of its 56,000 employees.

Venture Proposed By CDC Set to Roll

MINNEAPOLIS — A joint research and development venture by major U.S. computer industry firms came a step closer to reality when the newly organized Microelectronics and Computer Technology Corp. (MCC) was formally incorporated last month.

The cooperative venture was proposed by Robert Price, president and chief operating officer of Control Data Corp., at the spring conference of the Computer and Business Equipment Manufacturers Association in April 1981. About 15 U.S. semiconductor and computer firms have been meeting since then to iron out the objectives of the joint development venture — the first of its kind in the U.S.

However, when the incorporation of the venture was announced late last month, it was unclear exactly how many of the 15 firms participating in initial discussions with MCC had formally committed themselves to the venture. Of mainframe firms other than CDC, reportedly only Sperry Univac and NCR Corp. had formally agreed to participate in the venture, which Price said will require an annual budget of between $50 million and $100 million.

A primary reason for CDC's proposal of the venture is to offset competition from Japan, where joint technology development, in part sponsored by government funds, is the normal practice. Speaking at a meeting of the New York Society of Security Analysts, Inc. in New York late last month, Price said that "the major threat from Japan will be in the second half of the decade."

MCC will concentrate on four advanced long-range technology programs. One of these programs is advanced computer architecture, described as an eight- to 10-year program focusing on knowledge-based architecture and artificial intelligence. The thrust of this program, informally called Alpha-Omega, appears very similar to the Japanese development effort for the fifth-generation computer.

The other areas of research that have been proposed include microelectronics packaging, computer-aided design and manufacturing and software productivity.

CI Notes

DG Top-Level Shuffle Appoints Four

WESTBORO, Mass. — Data General Corp. recently made four top-level appointments in its business divisions and sales organizations.

Robert C. Miller, formerly senior vice-president of technology, was named senior vice-president of DG's three business units. Miller will have overall management, planning and business responsibility for the Information Systems Division (ISD), Small Business Systems Division and Technical Products Division.

DG announced that Miller will retain responsibility for DG's semiconductor facility in Sunnyvale, Calif., and Systems Architecture Group.

J. David Lyons, formerly national sales manager, was named vice-president of ISD. Lyons joined DG last year from IBM's Information and Technology Group in Harrison, N.Y.

Replacing Lyons as national sales manager is Clayton H. Reed.

B. Denison Olmsted was named European sales director.

'Big Eight' Firm's Service Assists Software Mergers

CHICAGO — Arthur Young & Co., one of the "Big Eight" accounting firms, has established a management advisory service to assist in the merger or acquisition of software companies.

The service, which initially will be offered only through the Arthur Young office here, will offer analysis of a software product's market fit and industry position as well as future prospects, assessment of the product's strengths and weaknesses compared with other offerings and financial analysis of growth and return on investment.

Heading the service is Robert P. Stanojev, director of the Chicago office's advanced technology consulting practice. More information can be obtained by contacting Stanojev at Arthur Young, One IBM Plaza, Chicago, Ill. 60611.

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Continental Acquires STSC, Firm Expanding Its Markets

(Continued from Page 81)

ended in May, STSC reported revenues of $27.7 million and a loss of $1.8 million. Last year revenues were $27.6 million and earnings were $1.9 million. Moreover, last April the company laid off about 13% of its work force.

"We have been in an intensive period of product development for the past three years and stepped up our marketing emphasis anticipating the products would have been ready a year ago," Dyer said. However, getting new products out the door took longer than the company expected.

In the meantime, the opportunity to be acquired by Continental came along. Continental, formerly Continental Telephone Corp., approached STSC last January with an acquisition proposal. Continental's business is currently 10% unregulated, and the firm wanted to expand its unregulated business to 25% of its revenues by 1986, Dyer reported. "It was clear from the way they approached us that they were serious," he continued. The merger, which paid $11 per share for all outstanding shares of STSC stock, is valued at about $24 million, Dyer said.

STSC has now become a wholly owned subsidiary of Continental, falling under the communications company's Information Services Group. The only management change being made is the addition of William M. Gibson as executive vice-president and chief operating officer. Prior to joining STSC, Gibson was vice-president of marketing for Strategic Information, a subsidiary of Ziff-Davis Publishing Co.

Broader Interests

At the time the acquisition offer was made, Dyer and the firm's other executives thought it was time for the company to begin relating to its broader interests.

One of those interests is expansion into the micro market. Besides adapting APL*Plus to the TRS-80 Model III, the firm is currently working on a version for IBM's Personal Computer. "The work space size in APL on the TRS-80 is roughly 25,000 bytes, and we expect several multiples of that to be available on the IBM Personal Computer. It will be a virtual system," Dyer said.

Although STSC has been turning its attention to micros in recent months, the bulk of the firm's revenues is still from time-sharing services. Moreover, since 1978 the firm has offered most of its time-sharing products on a licensed basis to users. The benefit here is that customers can gain experience with the product prior to bringing it in-house. In addition, by putting its new systems up first on a time-sharing basis, STSC gains experience with the system and can do any necessary tailoring before offering it on a licensed basis.

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CGX Corp. has completed its first round of venture capital financing of $1.8 million. Investors include General Electric Co., Arthur D. Little and Co., Fairfield Ventures, Sierra Ventures, Massachusetts Technology Development Corp. and Bessemer Venture Partners.

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National Computer Communications Corp. has signed a $5 million revolving line of credit with Chase Manhattan Bank, N.A.

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Ryan McFarland Corp. has completed its initial round of venture capital financing with $1 million in equity capital from Sequoia Capital III, Menlo Park, Calif.

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Supershorts

Redshaw, Inc. of Pittsburgh, Pa., vendor of computer software to independent insurance agencies in the U.S. and Canada, has joined The Hartford Insurance Group as an independently managed subsidiary.

— — —

Compuserve, Inc. has combined its value-added asynchronous data network with its Infoplex electronic mail facility into a new division, Compuserve Network Services.

— — —

IBM has awarded a $1 million grant to the University of Pennsylvania's School of Engineering and Applied Science to establish an "IBM Venture Fund." The grant will be used to support research in robotics, links between computers and cognitive science and advanced computer graphics and computer-aided design as well as to provide greater emphasis on laboratory experience for undergraduates.

— — —

Dr. Edmund Cranch, president of Worcester Polytechnic Institute, and Paul Guzzi, vice-president for administration at Wang Laboratories, Inc., have been elected to the board of the Wang Institute of Graduate Studies. The institute is an independent, nonprofit educational institution founded in 1979 by Dr. An Wang and is not affiliated with Wang Laboratories.

— — —

Century Analysis, Inc. has established a new division, the General Products Division, to market utility software and standard hardware products.

Mergers & Acquisitions

Disc Tech One, Inc. has purchased M/A-COM Inc.'s rigid disk drive operation for an undisclosed sum. The transaction consisted of a combination of cash, notes and royalties.

Sorcim Corp. has acquired **Innovative Software Applications, Inc.** for an undisclosed amount.

Nelson Software Systems has become a division of the **Softlaw Corp.** and will develop and market utility software for the various computers that Softlaw plans to serve.

Wespercorp has entered into an agreement and plan of reorganization with **California Minicomputer Systems, Inc. (CMS)** in which CMS will be merged with a wholly owned subsidiary of Wespercorp.

Continental Telecom, Inc. has reached an agreement in principle with **Cado Systems Corp.** for the acquisition of the firm by Continental. Under the proposed agreement, Continental will pay $10 per share for Cado common shares. Up to 49% of the total transaction will be in cash and not less than 51% will be in shares of Continental stock.

Scientific-Atlanta, Inc. has reached an agreement to acquire the assets and business of **Digital Video Systems, Inc.** of Toronto, Canada. The agreement calls for the initial payment of 800,000 shares of Scientific-Atlanta with additional payments in stock based on the company's success.

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Sorbus Cuts Service Pacts: Court Battle Continues Between MAI, Hubco Data

TUSTIN, Calif. — The Sorbus Service Division of Management Assistance, Inc. (MAI) has canceled the maintenance contracts of three users of processors produced by the firm's Basic Four Systems Division.

The terminations are part of an ongoing battle between MAI and third-party vendors offering upgrades to Basic Four Systems, which make alterations to Basic Four's Boss operating system. MAI contends it cannot adequately support systems that no longer comply with Basic Four operating system specifications. Some users of non-MAI upgrades say third-party enhancements are less expensive and do not pose significant changes to the Boss operating system [CW July 19].

One of the principal firms offering non-MAI enhancements is Hubco Data Products of Boise, Idaho. All three firms whose service contracts were terminated (Charm-Tex, Inc. of Brooklyn, N.Y.; LaSalle Electric Supply Co. of Livonia, Mich.; and Hammond & Irving, Inc. of Auburn, N.Y.) used Hubco processor upgrades, an MAI spokesman said.

Ongoing Court Battle

As part of an ongoing court battle between MAI and Hubco [CW July 19], Hubco asked the U.S. District Court for the District of Idaho for a temporary restraining order to stop MAI from terminating the service contracts of Hubco users. That bid was denied Aug. 18.

Several former Basic Four dealers, such as Hubco, have filed suit against MAI claiming they were treated unfairly.

The court is expected to decide the Hubco/MAI case later this year.

New Companies

Sumicom, Inc., will market microcomputer systems and peripherals and has headquarters at 17862 E. 17th St., Tustin, Calif. 92680.

Cambridge Digital Systems has been formed as an independent division of Compumart, Inc. and specializes in systems integration and support of high-level software languages. It is located at 65 Bent St., P.O. Box 568, Cambridge, Mass. 02139.

Unitronix Data Systems is an affiliate of Unitronix Corp. offering software packages to a variety of businesses including doctors, dentists, advertising agencies, publishers and office-supply dealers. The firm can be contacted at 197 Meister Ave., Somerville, N.J. 08876.

Euclid Computer, Inc. has been formed to market the E-1 microcomputer based on an 8086 microprocessor operating at 10 MHz. The company is located at 3699 W. 240th St., Torrance, Calif. 90505.

Kentek Information Systems, Inc. will develop and market an inexpensive electronic printer with a system for reprographic utilization. The firm is located in Allendale, N.J.

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Executive Corner

• Rick J. Martin has been named president and chief executive officer; Emanuel M. Wittels has been named chief of technology; Thomas J. Garvey, vice-president-marketing; and Samuel D. Glazer, director of software development for Parallel Computer Systems, Inc.

• Richard Andreini has been named president and CEO of Datamac Computer Systems, Inc.

• Robert C. Miller has been named senior vice-president of Data General Corp.'s three business divisions and J. David Lyons has been elected vice-president and general manager of the company's Information Systems Division.

• Paul D. Byrns has been appointed vice-president of systems architecture and analysis for Honeywell, Inc.'s Network Management Systems Division

• Ronald J. Ritchie has been appointed executive vice-president of Allied Information Systems Co., an operating unit of Allied Corp.

• Charles J. Nagle has been promoted to executive vice-president, finance and administration, at American Satellite Co.

• Martin A. Belsky has been named vice-president of applications software development for Burroughs Corp. Appointed vice-presidents and regional managers for the firm were T. Doyle Perry, Boston; Gordon R. Swanson, Minneapolis; Peter F. Weron, Chicago; and Robert D. Peters, Dallas.

• Robert D. Hall has been named vice-president, Design Automation Group, at NCA Corp.

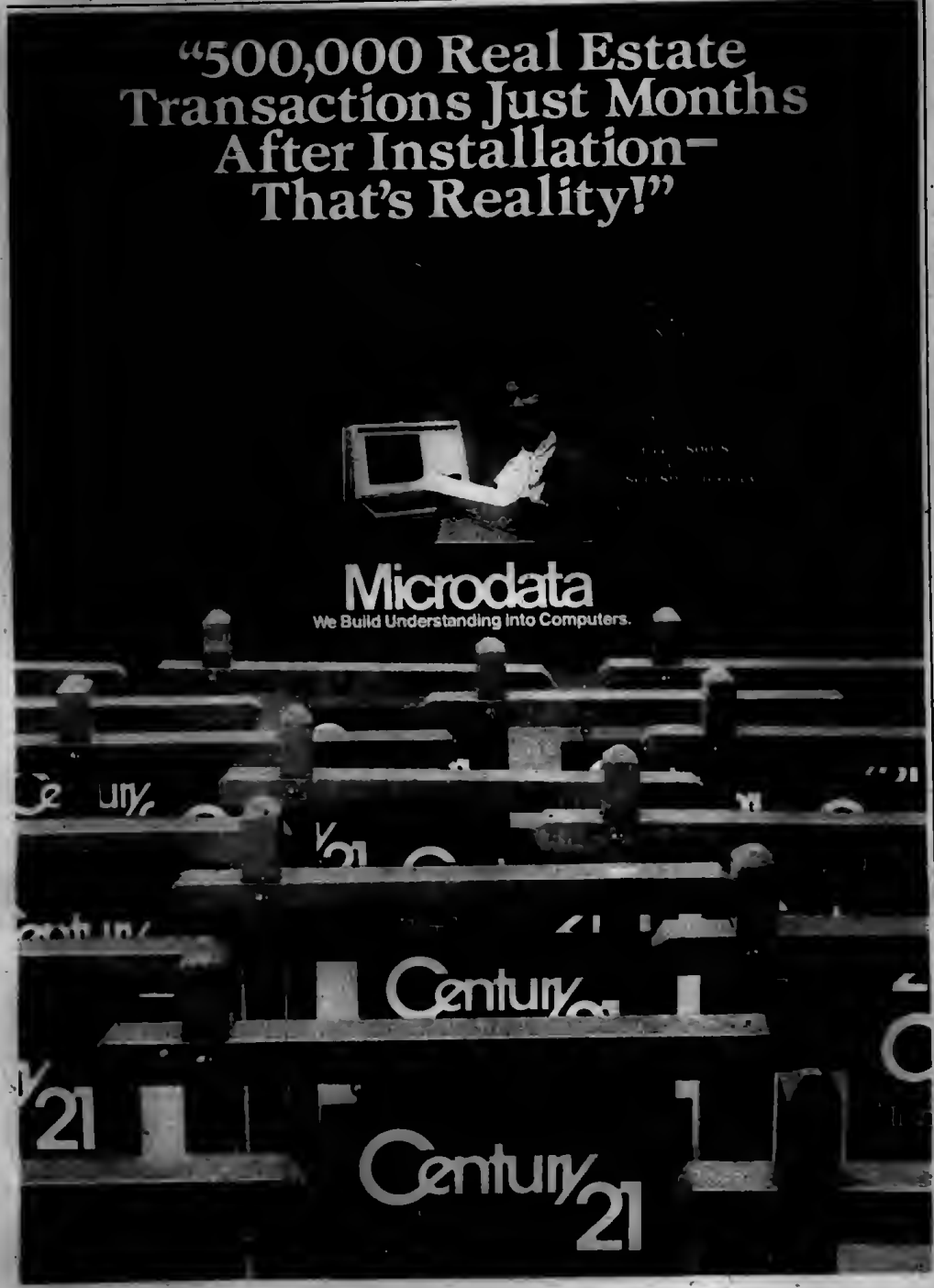
• David M. Director has been appointed vice-president and technical director, software, for Information Network Systems, Inc.

• Barry Law has been appointed vice-president of marketing for Scott Computer Leasing, Inc.

• Thomas C. Lorimor has joined Computer Maintenance, Inc. as vice-president of marketing.

• Jerome J. Meyer has been appointed group vice-president, Systems Group, for Honeywell, Inc.

• Gerald Andino has been named vice-president, office automation systems, for General Binding Corp.



Contracts & Pacts

Micro Baud Systems, Inc. has received an order for approximately $2 million from Direct, Inc. for its 300/1,200 bit/sec integral modem.

Anaconda-Ericsson's Communications Division has signed an agreement with Commterm, Inc. for voice-store-and-forward systems for integration with Anaconda-Ericsson public automated branch exchanges.

Micromation, Inc. has signed a contract with Financial Planning Consultants, Inc. (FPC) to supply 100 Mariner microcomputers, which FPC will market along with its financial planning software.

Altos Computer Systems, Inc. has reached an agreement valued at $4 million to $5 million to supply Computer Pictures Corp. of Boston with its 8- and 16-bit multiuser microcomputer systems.

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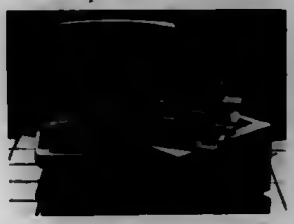

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- ☐ Computer Networks — KLEINROCK New York October 26-28
- ☐ IBM SNA 90 — DUZAN / ARTIS San Francisco November 8-10
- ☐ SNA — SANSOV / BERNSTEIN / Postmarketed Boston November 8-10
- ☐ Local Data Networks — ROBERTS / WEBB / WALDENSPURGER Santa Clara November 8-10
- ☐ Fault Tolerance — AVIZIENIS Los Angeles Nov 29-Dec. 1
- ☐ Operating Systems — KLEINROCK San Francisco Nov 30-Dec 2
- ☐ X.25 & Other Protocols — KARP / WEBB Boston October 25-27 San Francisco Nov 29-Dec 1

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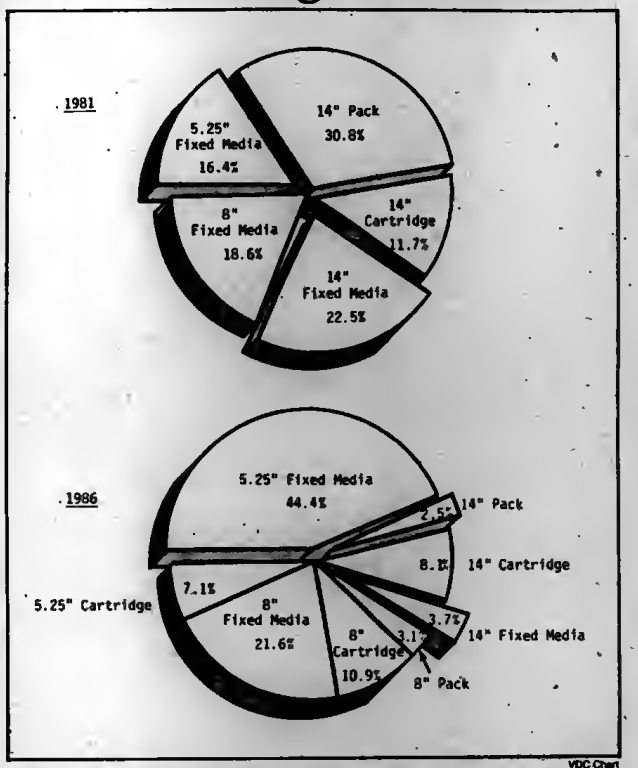
Hard Disk Mart Growth Seen Reaching $17.8 Billion



Disk Drive Shipments for Small Computer Systems: Share of Market by Product Type (Percent of Dollars)

WELLESLEY, Mass. — A report that predicts the hard disk industry will grow from $7 billion in 1981 to $17.8 billion by 1986 is being offered by Venture Development Corp. (VDC).

"The Hard Disk Industry II: A Strategic Analysis: 1982-1986" concludes that users of hard disk technology are continuing to demand more disk storage. By analyzing the marketplace according to general-purpose computers, minicomputers, small business computers, word processors and personal computers, the study found fixed-media Winchester disk drives will move steadily upward in terms of share of sales.

In 1981, fixed disk drives accounted for 58.7% of hard-disk dollar sales. By 1986, the firm says, fixed disk drives will account for 82% of hard-disk dollar sales.

In 1982, the report says, 8-in. disk drives will surpass 14-in. fixed media in unit sales. In addition, 5¼-in. drives will also surpass 14-in. fixed media drives in unit sales by 1984.

The full report costs $2,490 from VDC, 1 Washington St., Wellesley, Mass. 02181.

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Orders & Installations

Philips Information Systems, Inc. has been awarded a $10 million contract to supply word processing and professional workstations to the U.S. General Accounting Office and 24 regional offices and sub-offices.

Sperry Univac has received an order for both an 1100/61 processor valued at $1.3 million and an 1100/62 multiprocessor valued at $1.5 million from Kardex and Madison General Hospital, respectively.

Scientific Management Corp. has been granted a $30,000 contract for third-party computer maintenance from the U.S. Geological Survey.

ATM Network Management Corp. has been contracted by Transaxion Corp. to supply transaction-switching support.

Boeing Computer Services Co. has been awarded a $25.6 million contract by the U.S. Army Corps of Engineers for remote computing services.

Gould, Inc. has announced that its Electronic Power Conversion Division has been awarded a contract to provide uninterruptible power systems and ac line conditioners for embassies and other worldwide offices of the U.S. Department of State.

Cybernetics, Inc. has signed an agreement valued at $2 million with Irwin Olivetti, Inc. to provide 5¼-in. Winchester disk drives for Cybernetics' Cyberdrive mass storage system.

Insurance Information, Inc. has signed a three-year contract with Honeywell, Inc. for the purchase and resale of 300 DPS 6 minicomputers, potentially worth up to $14 million. The company will distribute Honeywell's DPS 6/31, DPS 6/32 and DPS 6/34 packaged business system configurations.

Systemhouse has been granted a contract by the University of Alaska to develop and install a Broadcast Teletext distribution system based on the new North American videotext standard known as Presentation Level Protocol as part of the university's service to off-campus students.

American Transair, Inc. has awarded a five-year contract to manage their computer facility to Anacomp, Inc.

Anacomp, Inc. has signed a multimillion-dollar agreement to license its Customer Integrated/Referenced File software system to the Riyad Bank, Jeddah, Saudi Arabia.

McDonnell Douglas Automation Co. has received orders for its new Stradis/Draw graphics systems from Petro-Canada Exploration of Calgary, Alberta; American International Group, New York City; and Doubleday and Co., Long Island, N.Y. Value of the contracts were not disclosed.

Dow Jones & Co., Inc. has signed a lease with T-Bar, Inc. for two, large computer-to-peripheral matrix switches. The order is valued at more than $180,000.

Galler Hospitality Systems, Inc.'s Micor system of property management have been installed by George V, Paris; International Hotel, New Orleans; and Ramada Renaissance, Atlanta.

Electronic Data Systems Corp. (EDS) has signed a $3 million addendum to its 10-year facilities management contract with HCA, Inc. Under terms of the agreement, EDS will continue to provide DP and data center management services for the firm.

Raytheon Data Systems Co. has been awarded a $16.4 million contract by the Environmental Protection Agency (EPA). Under the agreement, Raytheon will supply and service up to 2500 word processor units, which will be installed at central EPA facilities in Washington, D.C. and at approximately 50 regional and field offices throughout the U.S.

Systems & Information Dynamics, Inc. has installed its on-line freight rating and routing package, Trrims, at Hercules, Inc. for an undisclosed sum.

Codex Corp. has renewed its eight-year contract to supply modems and network control equipment to the Social Security Administration for use in the data acquisition and response system that connects all Social Security offices nationwide with its computer center in Baltimore. The total value of the ongoing contract is in excess of $18 million.

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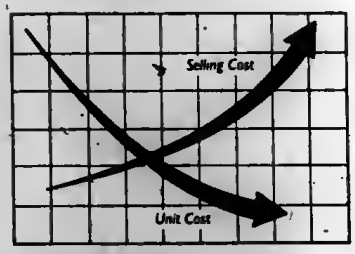

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Space Information Systems Operation

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Submit resumes to: William P. Tanis, Chief Personnel Officer, Administrative Office of the Courts, Justice Complex, CN-037, Trenton, NJ 08625.

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Our $750 million asset Bank is expanding its Data Processing Departments by the addition of the positions listed below. In each case we offer competitive starting salaries and full benefit package to those individuals who are looking for new career opportunities that allow for personal impact on the direction of our systems development. Please direct all resumes with salary requirement to Scott C. Stevens.

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Prefer 7-8 years of solid & progressive data processing experience to establish a quality assurance and change control function. Responsible for assisting in the establishment of project management standards, conduct systems design reviews and direct new change control functions. Ideal candidate will have strong knowledge and experience with system development life cycles and DP project management involving systems analysis, Cobol programming and on-line systems (CICS or IMS) in an IBM environment.

PROGRAMMER/ANALYST III

Prefer 5 years experience on IBM hardware (3033) with excellent Cobol skills in an OS/MVS environment. We will look for CICS expertise. TSO is a plus. Assembly background helpful.

PROGRAMMER/ANALYST II

Prefer no less than 2-3 years of application programming experience with Cobol in an OS/VS or OS/MVS environment. Prior Assembly expertise will be beneficial along with TSO as a plus. CICS experience will remain a key credential.

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S.L. Horne
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or
L.M. Foster
2320 Sunset Drive, P.O. Box 3766, Dept. 1
San Angelo, Texas 76901

GTE DATA SERVICES INCORPORATED
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Data Processing

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Programmers

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- **SYSTEMS ANALYSTS—Banking systems experience desirable**
- **DATA BASE ADMINISTRATORS**
- **SYSTEMS PROGRAMMERS—MVS, IMS, CICS**

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To arrange for a confidential appointment, CALL COLLECT: J. McKinney at 1-(716) 258-5406 or rush your resume to her c/o Personnel Department WB6, Lincoln First Bank, N.A., One Lincoln First Square, Rochester, New York 14643. We are an equal opportunity employer m/f.

Lincoln First Bank, N.A.

Scientific Database and Systems Development Coordinator

American Society for Metals, the world's leading source of technical information on metals, and the National Bureau of Standards are conducting a joint program to gather, evaluate, compile, disseminate, and store numerical and graphical data and textual information on alloy phase diagrams. Alloy phase diagrams are cornerstones of metallurgical technology that summarize the many characteristics and capabilities of existing and theoretical alloys. A key function in the program is the computerized information system for inputting, manipulating, storing and retrieving data that flow through the program.

The Database and Systems Development Coordinator will be responsible for developing software systems and establishing operation of the database, including interactive output capability.

The position is located at National Bureau of Standards headquarters at Gaithersburg, Maryland. Candidates should present their formal education and background in science and technology areas, and should be completely familiar with state-of-the-art methods in numeric and graphic data storage and retrieval, and in systems and software analysis and development. Experience in metallurgical or materials engineering is a plus. The position is available immediately.

Please submit your letter of interest, resume, and salary history and expectation to:

Mr. Hugh Baker
ASM Manager
Alloy Phase Diagram Program
AMERICAN SOCIETY FOR METALS
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Programmer/Analyst

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Newly created position requires a DP Specialist who will work closely with the 10 data centers and World Headquarters to analyze, recommend and administer systems, hardware and software to meet AFIA's standards. A thorough knowledge of IBM hardware and systems software, particularly 4300 series, and a sound understanding of telecommunications and distributed data processing are required.

INTERNATIONAL D.P. MANAGER/LIAISON

Position requires individual to establish guidelines and management procedures while monitoring the operations and providing overall management of AFIA's 10 international DP centers. Ideal background would include broad DP management experience particularly in a multi-site, or preferably, an international environment.

SR. PROGRAMMER ANALYST: UCC-FCS Package

The selected candidate will possess an indepth technical knowledge of programming and accounting plus the interpersonal strengths to instruct accounting personnel throughout our 10 data centers in the effective use of the FCS package. Knowledge of Cobol, CICS combined with a broad applications background is essential.

Positions offer worldwide travel to the 10 data centers located in Brussels, London, Madrid, Manila, Paris, Rio, Rome, Singapore, Sydney and Tokyo. Approximately 25% travel will be required. The salaries are commensurate with experience, benefits are comprehensive and the route to management is unencumbered. For immediate consideration forward your resume complete with salary history and requirement to **Mr. Gary H. Farnum, AFIA, 1700 Valley Road, Wayne, New Jersey 07470 (201) 696-0200, extension 409.**

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The deadline for classified advertising is ten days prior to the issue desired. (That's six working days prior to the issue date). Ads may be sent in by mail. For camera-ready ads, a velox or negative is required. For ads to be typeset by us, enclose a layout if needed along with any logos or artwork you would like to include in the ad. These must be dark and clear for reproduction purposes.

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1 column--1 13/16" or 11 picas
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Excellent benefits, salary, environment and opportunity for personal career growth. Please send resume, including salary history, in confidence to:

Barbara Mòes, Personnel Manager
CANOGA DATA SYSTEMS
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Data Base Administrator

White Stores Inc. Retail Hardlines chain located in Wichita Falls, Texas is seeking an experienced Data Base Manager. Successful candidate will have 7 years DP experience, including 2 years data base administration. Must be able to design and maintain the logical and physical structure of an IMS DB/DC data base. Responsibilities include recovery utilities, tuning, implementation, and application development support. This new position reports directly to MIS director in a large scale OS/MVS environment.

Systems Programmer

White Stores Inc. Retail/Wholesale Automotive Hardlines chain located in Wichita Falls, Texas, is seeking a Systems Programmer to help upgrade our data processing area. The successful candidate will have a minimum of 2 years systems programming experience with IMS/DB/DC in and MVS environment. Must have some knowledge of TSO/SPF procedures. Proven track record a must, degree preferred. Whites offers excellent compensation, benefit and relocation package. Send confidential resume and salary history to:

White Stores, Inc.
3910 Call Field Rd.
Wichita Falls, TX 76308
Attention Russell Crawford
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PROGRAMMER

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M/A-COM LINKABIT has an excellent compensation and benefits package. If you are looking for a career where performance is recognized and rewarded on an individual basis, please send your resume and salary requirement to Elaine Rigo, 10453 Roselle Street, San Diego, CA 92121.

M/A-COM LINKABIT, Inc.
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Manager of Systems & Development

This Academic Medical Center (Bowman Gray School of Medicine of Wake Forest University and North Carolina Baptist Hospitals, Inc.) is expanding their data processing services. Candidates must have a minimum of 7 years experience including the demonstrated ability to conduct feasibility studies, perform systems analysis and design for new projects as well as for enhancements and maintenance, develop realistic and measurable project plans, write programmer specifications, monitor performance of team members, provide technical guidance, and meet project objectives. Proficiency in COBOL with data base and on-line experience required. Experience with business financial systems highly desirable. Degree in Computer Science or Math preferred. The center offers competitive salaries and benefits. Send confidential resume with salary history to: **Bob Peterson, Manager Systems and Development, Medical Center Computer Center, 300 South Hawthorne Rd., Winston Salem, NC 27103.**

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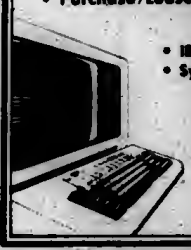

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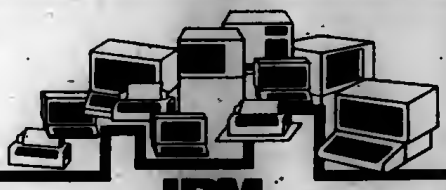

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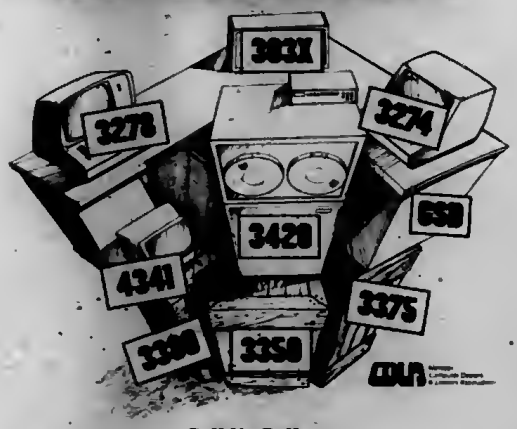

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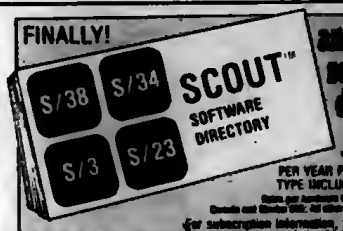

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Anderson Jacobson, Inc. 30
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Braegen Corp. 74
Burroughs Corp. 10-11
C.C.S., Inc. 85
Chubb Institute 28
ComData 63
Computer Associates 5
Computerisitics 82
Computer Power Systems 16
Computer Technology Group 42
Computer & Terminal Exchange 84
Computerworld Europe 34
Computerworld Extra 78
Computerworld In-Depth 32
Computerworld International 91
Computerworld Office Automation 76
CW Office Automation Forum 68
Computerworld Supplement 41
C.S. Computer 53
Cullinane Database Systems 39
Dallas Market Center 90
Data Systems for Industry 48
Data Systems Marketing 87
Dataware, Inc. 84
D.B. Systems, Inc. 42
DEMA 19
Digital Research 65
Dorleo Products 19
Duquesne Systems 47
Eastern Airlines 25
Eastman Kodak 51
E.M.C. 36
Emery Worldwide 40
Functionality Group 46
Fusion Products 52
General Electric Corp. 38
General Research Corporation 17
General Systems Center 72
H & W Computer Systems, Inc. 88
IBM/ASCII 33
IBM 89
ICCP 28
Infodata Systems 83
Informatics Corporate 50
Informatics Software 22-23
Information Concepts 6
Information Software & Services 86
Infoworld 18,46
Interface Ad Association 52-53
Invitational Computer Conference 6
Lawson Associates 24
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Storage Technology Corp. 80
Syncsort 3
SysEd 28
Tandem Computers 57-62
TASC 74
Technology Transfer Institute 72,88
Texprint 56
Transaction Technology 29
Typesetting Service Corp. 8
Walker Interactive Products 54
Wang Laboratories, Inc. 43
White Smith Ltd. 46
Xerox-OPD 14-15
Zenith Data Systems 34

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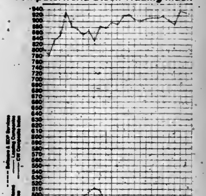

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	COMPUTER SYSTEMS				
A	AMDAHL CORP	18- 48	34 1/4	+ 1/8	+0.0
N	BURROUGHS CORP	28- 72	36	+1 5/8	+4.7
O	COMPUTER AUTOMATION	6- 28	10 1/4	+1 5/8	+18.8
N	CONTROL DATA CORP	18- 42	28 3/8	- 1/2	-1.7
N	CRAY RESEARCH INC	20- 49	28 1/8	+1 1/4	+4.6
N	DATA GENERAL CORP	21- 67	28 3/8	+1 3/8	+5.0
N	DATAPOINT CORP	11- 50	18 1/2	+1 1/8	+7.3
N	DIGITAL EQUIPMENT	62-113	81 3/4	+3 1/2	+4.4
A	EECO INC	6- 18	7 7/8	+1	+14.5
N	ELECTRONIC ASSOC.	5- 13	8 1/2	- 1/4	-2.8
N	FLOATING POINT SYST	13- 30	24 1/8	+1 3/8	+6.0
N	FOXBORO	22- 62	28 3/8	+2 3/8	+9.1
O	FULCRUM CORP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 16	4	+ 5/8	+18.5
N	HARRIS CORP	21- 50	28	+ 7/8	+3.2
N	HEWLETT-PACKARD CO	33- 54	52 3/8	+4 3/8	+9.1
N	HONEYWELL INC	60-113	75 5/8	+3 5/8	+5.0
N	IBM	48- 73	69 3/4	+ 5/8	+0.9
O	IPL SYSTEMS INC	5- 13	8 1/4	+ 3/4	+10.0
O	MAGNUSON COMP SYSTS	2- 32	2 5/8	- 1/8	-4.5
O	MANAGEMENT ASSIST	7- 28	8 5/8	0	0.0
O	MINI-COMPUTER SYST	0- 4	3/8	0	0.0
N	MODULAR COMPUTER SYS	7- 32	8 1/8	- 1/8	-1.5
N	MOHAWK DATA SCI	10- 33	14	- 3/8	-2.6
N	NCR	38- 76	60 5/8	+ 7/8	+1.4
N	PERKIN-ELMER	17- 38	22 1/2	+1 3/4	+8.4
N	PRIME COMPUTER INC	18- 48	23 3/8	+4 7/8	+0.7
N	SPERRY CORP	21- 63	24 7/8	+ 1/2	+2.0
N	TANDEM COMPUTERS INC	13- 35	22 3/4	+1 3/8	+6.4
N	TEXAS INSTRUMENTS	71-151	82 1/2	+3 1/2	+3.0
A	WANG LABS "B"	24- 37	33	+2	+6.4
A	WANG LABS "C"	21- 38	35	+2 5/8	+8.1
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	18- 28	22 1/2	+ 1/4	+1.1
N	COMDISCO INC	10- 27	17 3/8	- 5/8	-3.4
O	COMMERCE GROUP CORP	1- 1	5/8	+ 1/8	+25.0
O	COMPUTER INVSTRS GRP	1- 2	1/4	- 1/8	-33.3
O	CONTINENTAL INFO SYS	4- 6	5 1/2	- 1/4	-2.8
N	DPF INC	8- 13	10	+ 5/8	+6.0
O	ITEL	1- 6	5/8	0	0.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 30	27 3/4	+ 1/2	+1.8
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 8	1 3/4	+ 1/4	+16.6
O	ADVANCED SYSTEMS INC	9- 18	10 1/4	+ 3/4	+7.8
O	AGS COMPUTERS INC	7- 10	8 1/2	- 1/2	-5.5
O	ANACOMP INC	10- 18	10 7/8	- 1/2	-4.3
O	ANALYSTS INTL CORP	3- 14	7 1/2	+ 1/2	+7.1
O	APPLIED DATA RES.	13- 26	25	+1 3/8	+5.8
O	ASA COMPUTER SYSTEMS	11- 17	16 1/4	+1	+6.5
O	ASTRADYNE COMP IND	1- 8	1 1/4	+ 1/8	+11.1
N	AUTOMATIC DATA PROC	21- 32	23 3/4	+ 3/4	+3.3
O	CGA COMPUTER ASSOC	4- 28	6 3/4	- 1/4	-4.1
O	COMPUTER ASSOC INT'L	12- 21	20 3/4	+1 1/2	+7.7
O	COMPUTER HORIZONS	1- 3	2 3/8	- 1/8	-5.0
O	COMPUTER NETWORK	4- 8	6 1/8	+ 1/8	+2.0
N	COMPUTER SCIENCES	11- 30	13 1/2	0	0.0
O	COMPUTER TASK GROUP	10- 23	8 1/2	0	0.0
O	COMPUTER USAGE	2- 10	2 3/4	0	0.0
O	COMPUTONE SYSTEMS	12- 21	18	+ 1/4	+1.3
O	CONSERV CORP	8- 18	14 1/2	+ 1/2	+3.3
O	COMSHARE	6- 31	5 3/4	0	0.0
O	CULLINANE DATABASE	10- 37	33 5/8	+1 5/8	+5.0
O	CYCARE SYSTEMS INC	9- 14	8 1/2	- 1/4	-2.5
O	DATA DIMENSIONS INC	1- 3	1/4	- 1/8	-33.3
O	DATATAB	1- 4	5/8	0	0.0
O	DYSTRON CORP	2- 11	3	+ 1/8	+4.3
N	ELECTRONIC DATA SYST	18- 32	31 1/4	- 1/4	-0.7
O	INFORMATICS INC	10- 23	13 1/2	+ 3/4	+6.3
O	INSYTE CORP	1- 3	2	- 1/4	-11.1
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	4	0	0.0
N	LOGICON	12- 38	18 3/8	+ 5/8	+4.2
O	MGMT SCI AMER INC	17- 28	23 3/4	+1 3/4	+7.8
O	MATHEMATICA INC	9- 17	13 1/2	+ 1/2	+3.8
O	MATHEMATICAL APP GRP	12- 28	13 1/2	-1	-7.4
O	NATIONAL DATA CORP	13- 28	17 1/4	+3 1/4	+13.0
O	PANSOPHIC SYSTEMS	9- 18	11 1/4	+1	+9.7
O	PLANNING RESEARCH	6- 13	7 1/8	+ 1/4	+3.6
O	PROGRAMMING & SYS	1- 2	1 3/8	-	-4.3
O	REYNOLDS & REYNOLD	18- 28	23	+1 1/2	+7.3
O	SEI CORP	17- 28	23 3/4	+ 1/4	+1.0
O	SHARED MEDICAL SYST	28- 37	32 3/8	- 5/8	-1.8
O	STSC INC	6- 28	10 3/4	0	0.0
O	SCIENTIFIC COMPUTERS	9- 16	8 1/3	+ 1/3	+3.5
O	SOFTWARE AG	9- 33	7	- 3/8	-5.0
O	TYMSHARE INC	13- 38	16	+1 1/8	+8.2
A	URS CORP	10- 18	11	+ 3/8	+3.5
O	WYLY CORP	7- 20	10 1/8	+ 1/8	+1.2
	PERIPHERALS & SUBSYSTEMS				
O	AM INTERNATIONAL	1- 18	1	0	0.0
A	ANDERSON JACOBSON	6- 28	10 5/8	- 3/8	-3.4
O	AUTO-TROL TECHNOLOGY	6- 62	12 7/8	+2 1/4	+21.1
O	BANCTEC INC	7- 35	10 1/4	- 1/8	-1.2
N	BEEHIVE INT'L	6- 18	8	- 1/8	-2.6
N	BOLT,BERANEK & NEW	8- 25	18 1/8	+ 5/8	+4.0
O	CAMBEX CORP	2- 8	2 1/8	- 1/8	-5.6
N	CENTRONICS DATA CORP	7- 40	7 1/8	- 1/8	-1.7
A	CETEC CORP	4- 8	4 1/2	+ 5/8	+8.0
O	COGNITRONICS	2- 11	3 3/4	+ 5/8	+20.0
O	COMPUTER COMMUN.	1- 2	3/8	- 1/8	-14.8
A	COMPUTER CONSOLES	18- 28	23 1/8	-1 1/4	-5.1
O	COMPUTER DEVICES INC	4- 10	8 3/4	- 5/8	-6.6
O	COMPUTER TRANSCEIVER	3- 8	3 3/4	- 1/2	-11.7
N	COMPUTERVISION CORP	20- 49	28	+1 1/8	+4.0
N	CONRAC CORP	17- 28	25 7/8	- 1/2	-1.8
A	DATA ACCESS SYSTEMS	2- 10	1 3/4	+ 3/8	+27.2
A	DATAPRODUCTS CORP	16- 44	23	+1 3/8	+6.3
O	DATARAM CORP	4- 18	8 1/2	- 3/4	-12.8
O	DATUM INC	2- 8	2	+ 1/4	+14.2
O	DAVID JAMISON CARLYL	2- 7	3 7/8	+ 1/8	+3.3
O	DECISION DATA COMPUT	3- 8	6 1/2	- 1/8	-2.2
O	DELTA DATA SYSTEMS	1- 4	1 1/8	- 1/8	-10.1
O	ELECTRONIC M & R	3- 8	4 1/4	+ 1/4	+6.2
O	EVANS & SUTHERLAND	18- 48	27 1/2	+ 3/4	+2.8
O	GEN'L DATA COMM IND	7- 18	8 1/2	+ 1/4	+2.0
O	GENERAL TERMINAL CP	0- 4	1/4	0	0.0
O	GREAT SOUTHWEST IND	1- 12	5 1/2	+ 3/8	+7.6
N	HAZELTINE CORP	18- 39	27	+ 1/4	+0.9
O	INFORMATION INTL INC	8- 17	14	+1 1/4	+9.8
O	INTEL CORP	21- 31	30 1/2	+ 3/4	+2.1
O	IPL SYSTEMS INC	3- 15	5 1/4	+ 3/4	+16.6
A	LUNDY ELECTRONICS	7- 16	10 3/8	- 7/8	-7.7
O	MSI DATA CORP	11- 27	18 1/4	+1 3/4	+10.6
O	NETWORK SYSTEMS CORP	14- 28	24	+ 7/8	+3.7
O	OMEX	3- 8	3	0	0.0
N	PARADYNE CORP	24- 62	33 3/4	- 1/8	-0.3
O	PENRIL CORP	7- 17	8 1/2	- 1/4	-2.9
O	RAMTEK CORP	8- 23	13 1/4	+ 3/4	+6.1
O	RECOGNITION EQUIP	4- 21	4 3/8	0	0.0
O	SCAN DATA	1- 8	1 1/4	0	0.0
N	STORAGE TECHNOLOGY	19- 40	20 3/4	+ 7/8	+4.4
O	SYKES DATATRONICS	7- 34	7 1/2	-7 1/2	-50.0
N	T BAR INC	7- 18	7 7/8	+ 1/8	+3.2
A	TEC INC	4- 11	8 3/8	- 1/2	-5.6
N	TEKTRONIX INC	38- 70	40 3/4	+ 5/8	+1.6
N	TELEX	8- 18	10	+ 1/2	+5.2
O	TERADATA SYSTEMS CP	3- 17	4 1/8	+ 3/8	+10.0
O	TIMEPLEX INC	7- 16	10 5/8	+ 7/8	+9.0
O	VISUAL TECHNOLOGY	8- 15	12 1/4	+1 3/4	+16.6
O	WILTEK INC	1- 3	1	0	0.0
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	15- 17	16 3/8	+ 1/4	+1.5
O	BALTIMORE BUS FORMS	1- 2	1	- 1/4	-20.0
N	BARRY WRIGHT	16- 34	18 5/8	+ 1/8	+0.6
O	CYBERMATICS INC	1- 2	1	0	0.0
O	DUPLEX PRODUCTS INC	12- 17	14 1/2	+ 1/2	+3.5
N	ENNIS BUS. FORMS	19- 23	22 1/8	- 1/8	-1.1
N	3M COMPANY	48- 59	60 1/2	+1 1/4	+2.1
O	MOORE CORP LTD	28- 38	31 3/4	+ 1/8	+0.3
N	NASHUA CORP	9- 33	18	0	0.0
O	STANDARD REGISTER	30- 47	47 1/8	+1 1/4	+2.7
A	TAB PRODUCTS CO	12- 30	18 1/8	+2	+16.0
N	WALLACE BUS FORMS	22- 38	38	+2 5/8	+8.1

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